THE ESSENTIALS

OF

MATERIA MEDICA, THERAPEUTICS,

AND THE

PHARMACOPŒIAS.

FOR THE USE OF STUDENTS AND PRACTITIONERS.

BY

ALFRED BARING GARROD, M.D.,

Professor of Materia Medica, Therapeutics, and Clinical Medicine in University College, London, and Physician to University College Hospital.

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PREFACE.



THE Author of the present volume has for some years devoted time and attention to a special study of the therapeutic action of drugs, and had hoped ere this to place the results of his labour before the Profession. In the progress of his task, however, he discovered that every new fact obtained, suggested a new subject for investigation and research, while the experience gained by clinical observation did not tend to diminish the difficulties which seemed to him to surround so exhaustless an inquiry. He was, moreover, unwilling to content himself with a compilation of the data collected by others, or with that apparent simplification of the subject so common in works on therapeutics, but which too often results only from a hasty credence in statements consonant with the writer's ideas, and a neglect of others not in harmony with those preconceived conclusions.

The Author still cherishes the hope that he will in no long period be enabled to embody his experience in a larger and more diffuse production. The *present* work, however, has been written with a special and somewhat different purpose. It is intended to serve the student as a text-book of Materia Medica, and, while

it is hoped, that it omits nothing essential to the study of the science, it excludes those details, often embarrassing to the student, and seldom necessary to the practitioner. It has been his object, while limiting its size, to include all points connected with the officinal preparation of medicines, and so much information on the therapeutic action of drugs as would serve as a sufficient guide in actual practice. All controversial points have been avoided, as unsuited to the design of the work, and the information confined to the facts really ascertained as to the action of each drug, and the purposes for which it has been advantageously employed.

63, HARLEY STREET,
May, 1855.

INTRODUCTORY REMARKS.



By the term *Materia Medica* is understood that branch of medicine which treats of the agents employed in the cure of disease. In the present volume it will be restricted to the discussion of so much of the origin, properties, composition, and preparation of the various material substances commonly employed as remedies, as the Author considers essential to be known by those engaged in their administration. It will also include all the officinal preparations contained in the London Pharmacopœia, with selections from those of the Edinburgh and Dublin Colleges, when such have been thought important. The word *Therapeutics*, in the present work, is confined to the description of the special action of each drug on the animal economy, and the enumeration of the diseased conditions in which it may be advantageously administered. All general therapeutic inquiries have been purposely reserved for a future work, as have likewise, the consideration of the effects of certain therapeutic agents, as general and local bleeding, electricity and baths, which could not have been advantageously introduced unless a considerable space had been devoted to them.

In the various officinal preparations, constant reference is made to weights and measures, temperature, &c.; and the following remarks, extracted in substance from the London Pharmacopœia, are important to be known.

Two kinds of weights are used in England; by one of which, gold and silver, and by the other nearly all kinds of merchandise, are valued: the former, which is called Troy weight, is employed in pharmacy, and the pound is thus divided:—

The Pound,	℔	contains	Twelve Ounces,	℥xij
The Ounce,	℥	,,	Eight Drachms,	ʒviij
The Drachm,	ʒ	,,	Three Scruples,	℈iij
The Scruple,	℈	,,	Twenty Grains,	gr.xx
The Grain,	gr.			

Measures of liquids, derived from the gallon, defined by the laws of the kingdom, are made use of. This, for medicinal purposes, is thus divided, viz.:—

The Gallon .	. C	Eight Pints .	. Oviij
The Pint .	. O	Twenty Fluid Ounces	f.℥xx
The Fluid Ounce	f.℥	Eight Fluidrachms .	f.ʒviij
The Fluidrachm	f.ʒ	Sixty Minims .	♏lx
The Minim .	. ♏		

The signs by which each weight and measure are denoted will be seen appended above.

Care must be taken that medicines do not acquire any impurity from the material of the vessels in which they are either prepared or kept; therefore, unless otherwise ordered, glass, or vitrified ware, such as porcelain or stone, should be employed, whose surface is not glazed with lead.

All acid, alkaline, or metallic preparations, and salts of every kind, should be kept in stoppered glass bottles, and occasionally those made of green or black glass are desirable.

When the saturation of acids or alkalies is ordered, it is supposed that this is determined by the use of litmus or turmeric papers; and when crystallised carbonate of soda is employed to saturate any acid, the carbonic acid should be expelled from the liquid by heat before the tests are

applied. In applying tests, distilled water should be made use of; and, unless otherwise ordered, white bibulous paper should be used.

In the filtration of liquids, or drying of crystals, degrees of heat are measured by Fahrenheit's thermometer: boiling heat is 212°; a gentle heat between 90° and 100°. Specific gravities are to be taken at the temperature of 62°. In ascertaining the weight of any precipitate, the precipitant should be added in excess, and the precipitate well washed, and afterwards dried at 212°; care, however, is sometimes necessary in order that the precipitate be not redissolved by the excess of the precipitant.

Crucibles should be made of Hessian or Cornish ware.

Exposure to hot water, or the vapour of boiling water, in a proper vessel, constitutes a *Water Bath*.

A *Sand Bath* consists of sand heated in a suitable vessel.

It must be borne in mind that the Dublin College makes use of the avoirdupois weight in the dispensing of medicines, and have altered the subdivisions of the avoirdupois pound in the following manner:—

1 Pound avoirdupois	=	16 Ounces	=	7000 Grains
1 Ounce ,,	=	8 Drachms	=	437·5 ,,
1 Drachm ,,	=	3 Scruples	=	54·68 ,,
1 Scruple			=	18·22 ,,

It will be observed that the Dublin ounce, drachm, and scruple, are smaller than those in apothecaries' weight; but that the pound, consisting of 16 ounces, is much larger, in the proportion 7000 to 5760.

In dispensing the preparations of the Dublin Pharmacopœia, it is important that the difference of the weights should be taken into consideration.



MATERIA MEDICA.

INORGANIC SUBSTANCES.

CARBON.

(C. Eq.=6.)

An elementary body found pure, or almost so, in the diamond, plumbago, and anthracite; combined with other elements, it enters into almost all vegetable and animal substances. In medicine it is now only employed in the form of charcoal, of which there are two varieties, vegetable and animal.

Carbo *Lond.* formerly Carbo Ligni, Wood Charcoal.

Prep. Obtained by burning wood with a limited supply of air, by which the hydrogen, &c. are burnt off, and the carbon remains. Wood yields from 17 to 23 per cent. It is met with either in the form of the pieces of wood from which it was made, or as a black powder.

Prop. & Comp. It is odourless, and almost tasteless; it possesses the power of absorbing gases and odours to a great extent, especially when recent; besides carbon, it contains some salts, about 2 per cent.

Off. Prep. Cataplasma Carbonis, Lond. Charcoal Cataplasm. (Boiling water, f.℥x; bread ℥ij; powdered linseed ℥x; powdered charcoal ℥ij. Mix the water, bread, and linseed; then add two drachms of the charcoal, and sprinkle the remainder on the surface.)

Therapeutics. It has been employed on account of its absorbing power, as an antiseptic and corrector of acidity and flatus of the stomach and intestines, and to correct the state of fæces in some diseases. Its use at present is almost entirely confined to its external application in the form of poultice, to prevent the

fœtor of ulcers, &c. Dr. Stenhouse has recently proposed its being used in the manufacture of respirators for those subjected to the influence of injurious gases or vapours.

Dose. Internally from a teaspoonful to a tablespoonful, recently made, and carefully preserved in stoppered vessels.

Carbo Animalis *Lond.* Animal Charcoal.

Prep. By burning bullock's blood; Ph. Lond.; more commonly from bones; it can be made from any animal matter; it occurs in small pieces, or as a black powder, more or less fine.

Prop. & Comp. Inodorous and almost tasteless; absorbs gases and odours, and has a'so great power in abstracting almost all principles from their solutions, such as alkaloids, bitter and colouring matters, &c. Besides carbon it contains saline matters, small in amount if from blood; if from bones, the earthy salts are more than 90 per cent.

Therapeutics. Animal charcoal may be used in the same way and for the same purposes as vegetable, in addition to which the author has shown that its antidotal power against vegetable poisons is very great, rendering inert opium, nux vomica, aconite, and almost all the active organic poisons.

Dose. As an antacid and corrector of fœtor, from a teaspoonful to a tablespoonful; as an antidote, from ʒß to ℥ij or more, according to the amount of poison taken; it may be suspended in water for a short time, and thus administered.

Carbo Animalis Purificatus *Edin. Dub.*

Prep. Made by treating bone black with very dilute hydrochloric acid to remove all the salts, then washing and drying.

Use. In pharmacy to deprive alkaloids, &c. of colour; it may also be used as carbo animalis.

SULPHUR.

(S. Eq.=16.)

An elementary body found native as virgin sulphur; also in combination, as sulphurets of metals, &c.

Sulphur *Lond.* Sublimed Sulphur; Flowers of Sulphur.

Sulphur Præcipitatum *Lond.* Precipitated Sulphur.

Prep. Sublimed sulphur is generally prepared from the virgin sulphur, by causing it to rise in vapours, which are condensed in a chamber. It may also be made from any metallic

sulphuret, but is then more liable to contain impurities, as arsenic, &c. The precipitated sulphur is stated in the London Pharmacopœia to be prepared by throwing it down, by means of hydrochloric acid, from a solution of sulphuret of calcium.

Prop. & Comp. *Sublimed* sulphur is a citron or bright yellow coloured powder, sp. gr. 1·98, which rises in vapour at 600° Fah., soluble in hot oil of turpentine and bi-sulphuret of carbon, and to a small extent in oils. *Precipitated* sulphur forms a pale yellow powder, in other respects resembles sublimed sulphur. Neither should give an acid re-action to water; the composition of both is the same. When heated to a certain point sulphur assumes a peculiar viscid condition.

Off. Prep. Of sulphur (sublimed). UNGUENTUM SULPHURIS, LOND. Ointment of Sulphur. (Sulphur ℔ß; lard ℔j. Rub them together.)

UNGUENTUM SULPHURIS COMPOSITUM, LOND. Compound Ointment of Sulphur. (Sulphur ℥iv; white hellebore powdered ʒx; nitrate of potash powdered ℈ij; soft soap ℥iv; lard ℔j. Rub them together.)

Therapeutics. In small doses sulphur is absorbed and then acts as a stimulant to the skin and different mucous membranes, passing off as sulphuretted hydrogen from the skin, becomes also partly oxidised, increasing the amount of sulphuric acid in the urine. In larger doses it produces a laxative or very mild purgative effect upon the bowels. Externally it is a slight stimulant and has the power of destroying the acarus scabiei or itch insect. It is given as a stimulant in chronic cutaneous affections, chronic bronchitis, and rheumatism; as a laxative to children and delicate persons; also in diseases of the rectum, as piles. Externally it is applied as an ointment in skin affections, especially scabies.

Dose. As a stimulant, from gr. x upwards. As a laxative, ʒß to ʒj or ʒij. Formerly sulphur dissolved in olive oil, called balsam of sulphur, was a favourite remedy in chronic bronchitis and rheumatism.

Adulteration. Sublimed sulphur may contain a trace of sulphurous acid from oxidation during sublimation; when washed it is called *sulphur lotum.* The precipitated sulphur contains often from 50 to 70 per cent. of sulphate of lime, arising from sulphuric acid being used to precipitate it; this can be detected by its not subliming with heat.

PHOSPHORUS.

(P. Eq.=32.)

Phosphorus *Lond.* Phosphorus.

Prep. From phosphoric acid or superphosphate of lime (made by acting upon bone ashes with oil of vitriol) by distillation with charcoal, when carbonic acid is formed and phosphorus set free and sublimes.

Prop. & Comp. A waxy-looking substance, usually in the form of pipes, from being cast into moulds, almost colourless and transparent when fresh, luminous in the dark, from oxidating and forming phosphorous acid ($P\,O_3$), very easily inflamed; sp. gr. 1·77; melts at 108° Fah.; insoluble in water; soluble in ether, oils, and true naphtha; when burnt, forms phosphoric acid ($P\,O_5$); becomes opaque and reddish on surface when old, from the formation of a sub-oxide, to prevent which it should be kept in water and in the dark.

Therapeutics. Very seldom given internally; it is said to act as a powerful stimulant and aphrodisiac, producing considerable gastro-intestinal irritation and other dangerous effects in large doses; it has been employed on the continent in low fevers, cholera, &c. The fumes of phosphorus produce on individuals exposed to them for a lengthened period, a peculiar disease of the jaw-bone, probably from phosphorous acid being present.

Dose. Gr. $\frac{1}{40}$ to gr. $\frac{1}{10}$ dissolved in ether or olive oil. Phosphorus is introduced for the preparation of phosphoric acid.

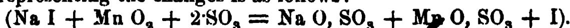
IODINIUM. IODINE.

(I. Eq.=126.)

Iodinium *Lond.* Iodine, in crystals (so named from ἰώδης, violet).

Prep. Iodine is prepared from kelp, the vitrified ashes of sea-wrack, found in the Western Islands, north of Scotland and Ireland; from the solution of this substance, after the crystallisation of most of the salts as the carbonate of soda, &c., a liquor remains, containing the iodides of sodium, potassium, and magnesium; this, when treated with sulphuric acid and binoxide of manganese, yields iodine, which sublimes, and is collected in receivers; by means of the peroxide of manganese

oxygen is set free and replaces the iodine; if we suppose one equivalent of iodide of sodium to be acted on by one of binoxide of manganese and two of sulphuric acid, the formula representing the changes is as follows:



$$(Na\,I + Mn\,O_2 + 2\cdot SO_3 = Na\,O,\,SO_3 + Mn\,O,\,SO_3 + I).$$

Prop. & Comp. Black scales with metallic lustre, sp. gr. 4·95, odour similar to chlorine, melts when heated, then sublimes in violet vapour, soluble in rectified spirits and ether, but slightly so in pure water, about $\frac{1}{7000}$ part, much more soluble in a watery solution of iodide of potassium and chloride of sodium. The solutions precipitate starch of a dark-blue colour. In free alkaline solutions iodine dissolves and forms salts.

Off. Prep. Tinctura Iodinii Composita, Lond. Compound Tincture of Iodine. (Iodine ℥j; iodide of potassium ℥ij; rectified spirit Oij. Macerate until the ingredients are dissolved, and strain.)

Unguentum Iodinii Compositum, Lond. Compound Ointment of Iodine. (Iodine ʒß; iodide of potassium ʒj; rectified spirit, f.ʒj; lard ℥ij. Add the iodide, reduced into the finest powder, to the lard, then the iodine dissolved in the spirit, and mix all together.) Free iodine is also contained in Liquor Potassii Iodidi Compositus, Lond.

Tinctura Iodinii Caustica, or Caustic Tincture of Iodine, for external use, can be prepared by dissolving grs. xlviij of iodine, and ʒj of iodide of potassium, in f.℥j of highly rectified spirit.

Therapeutics. When applied externally, free iodine acts as an irritant, or vesicant, according to the mode of using it; and when rubbed in for some time, it is absorbed, and influences the neighbouring parts, and also the system at large: when the diluted vapour is inhaled, it acts topically on the mucous membranes of the respiratory passages. Internally, free iodine produces irritation of the mucous membrane of the alimentary canal, causing, in large doses, heat and pain at epigastrium, and vomiting; and, for the most part, when the full influence of iodine upon the system is desirable, the drug is given in some of its combinations, more especially as iodide of potassium, which produces but little local irritation. Iodine is rapidly absorbed into the blood, and can be detected in many of the fluids soon after administration, especially in the urine; the constitutional effects produced, are increased activity of most of the secreting and excreting organs, as the kidneys, mucous membranes, and skin; it also powerfully influences the glandular and absorbent systems, as seen when such parts are enlarged, as in bronchocele, in

scrofulous glands of the neck and abdomen, and is stated occasionally to cause the wasting of even healthy glands, as the breasts and testes; it has a powerful alterative action, exhibited in its influence over scrofulous affections and secondary syphilitic disease. When given in large medicinal doses, the mucous membrane of the nose, frontal sinus, eyes, pharynx, &c., often become much irritated, and catarrhal symptoms, coryza, &c., are induced; occasionally much depression ensues from its administration, accompanied by a low febrile state of system.

Iodine or iodide of potassium is administered in very many diseases, as the different forms of scrofula, in bronchocele and other glandular enlargements, in hypertrophy and induration of organs or parts produced by inflammation, as in hypertrophy of the spleen, liver or uterus, nodes, &c.; in chronic skin affections, syphilitic or not; for the relief of other secondary or tertiary symptoms, and also in chronic rheumatism; in dropsies as a diuretic; in some forms of amenorrhœa, as an emmenagogue; and in various obstinate mucous discharges, as leucorrhœa, as an alterative.

Externally iodine is used in chronic skin diseases and over enlarged and indurated parts and diseased joints, to alter action or cause absorption; for this purpose it may be applied in the form of the compound tincture or ointment. As a speedy vesicant, the strong tincture may be painted over the part two or three times; one application, however, is often sufficient. A few drops of the tincture, put into half-a-pint of hot water, may be used as an inhalation in some forms of chronic bronchitis and phthisis.

Dose. Of iodine (free) ½ gr. gradually increased; of tinct. iodinii comp. Lond. ♏v to ♏xx; of liq. potassii iodidi comp. Lond. ʒij upwards; of iodide of potassium *vide* Potassii iodidum.

Adulteration. Water is often present, also iodide of cyanogen; besides these, fixed impurities, as plumbago, black oxide of manganese, charcoal, iron, &c. The first two are volatile; water can be detected by finding whether bibulous paper is moistened by the iodine; iodide of cyanogen by distilling at a very low temperature, when this body sublimes, if present, in white crystalline needles before the iodine; the fixed impurities are left after sublimation. The London Pharmacopœia gives the following quantitative test: "39 grains of iodine and 9 grains of lime, dissolved in 3 ounces of water by means of a gentle heat, should give a solution of a yellow or brownish colour;" if the iodine be adulterated the solution is colourless, as the 9 grains of lime have the power of converting almost

39 grains of iodine into iodide of calcium and iodate of lime, salts devoid of colour.

Sulphuris Iodidum *Lond.* Iodide of Sulphur.

Prep. (Sulphur ℥j; iodine ℥iv. Put the sulphur in a glass vessel, and place on it the iodine; hold the vessel immersed in boiling water until they have united; afterwards, when cool, the vessel being broken, break the iodide into fragments, and keep in a well-stoppered vessel.)

Prop. & Comp. A bluish black crystalline metallic-looking substance, not unlike sulphuret of antimony in appearance, having the odour of iodine, stains the skin yellow, decomposed by boiling in water, and, if properly prepared, should give, when so boiled, 20 per cent. residue of sulphur. Composition (IS_2) or a bisulphuret of iodine.

Off. Prep. Unguentum Sulphuris Iodidi, Lond. Ointment of Iodide of Sulphur. (Iodide of sulphur powdered ℨſs., lard ℥j. Rub them together.)

Therapeutics. Applied externally it acts in a manner very similar to iodine, and has been employed in some obstinate chronic skin diseases, as lepra, porrigo, acne indurata, &c. Internally it possesses no particular value, but has been given as an alterative.

Dose. Gr. ½ to gr. iij or more.

BROMINIUM. BROMINE.

(Br. Eq.=80.)

Bromine (so named from βρωμος, a stench,) was formerly in the London Pharmacopœia, as was also one of its salts, bromide of potassium. It is contained in sea water, sea plants, &c.

Prep. From bittern, the liquor left from sea water, after the crystallisation of common salt; it is present as bromide of magnesium, and can be obtained by passing a current of chlorine gas through the liquor, which unites with the magnesium, and liberates the bromine; this is often taken up by shaking with ether, which dissolves the bromine, and rises with it to the surface. Subsequent purification is required, usually effected by converting the bromine into bromide of potassium, and again liberating the bromine by means of bin-oxide of manganese and sulphuric acid.

Prop. & Comp. A dark brownish-red liquid by reflected, but hyacinth-red by transmitted light through thin layers, of an

intensely disagreeable acrid odour and taste, very volatile, and fumes when exposed; soluble in ether, alcohol, and slightly in water; soluble in alkaline solutions, forming salts; precipitates starch of an orange colour.

Therapeutics. Bromine is never administered but as bromide of potassium. The effects of this salt resemble in many respects those of the iodide, acting as a powerful alterative; from the author's experience, however, it differs in many important points; not irritating the mucous membranes of the air-passages, and in larger doses inducing symptoms referable to the nervous system not observed during the administration of the iodide. It may be given in scrofula, hypertrophy of spleen and liver, in chronic skin diseases, secondary syphilis, &c.

Dose. Of bromide of potassium, gr. v upwards.

CHLORINIUM. CHLORINE.

(CL. EQ.=35.5.)

Free chlorine occurs in the form of a greenish-coloured gas, having a peculiar acrid odour, very soluble in water, especially when cold; it possesses intense chemical powers, bleaches all vegetable colours, and acts as a powerful disinfectant, probably by decomposing the organic particles producing diseases. For this purpose it can be evolved from chlorinated lime by the addition of some acid, or more economically by the following method:—Mix one part of common salt and one part of bin-oxide of manganese intimately together, and add to these, put into a shallow dish, two parts by weight of oil of vitriol previously diluted with two parts of water; such a mixture will continue to give off chlorine for some days.

Liquor Chlorinii *Lond. Appendix.* Solution of Chlorine, or chlorine water (recently prepared).

Prep. LOND. (Hydrochloric acid, f.℥j; bin-oxide of manganese, powdered, ʒij; distilled water O℥. Mix the acid and bin-oxide in a retort, then pass the chlorine through the water until it has almost ceased to be given off.) In this process the decompositions which take place are represented in the formula ($2\,HCl + Mn\,O_2 = Mn\,Cl + 2\,HO + Cl$).

Prop. & Comp. A liquid, having a slight green colour, and very strong odour of chlorine, when exposed to light, is decomposed with the formation of hydrochloric acid and oxygen, and hence ordered to be used recently prepared.

Use. Ordered by the London College only as a test; its

use is described under Quinine and Morphia: it is useful in liberating iodine from combinations. Its action as a remedy resembles that of the liquor sodæ chlorinatæ; and it may be used, when diluted about seven times with water, as a gargle or lotion, or still more dilute as an internal remedy in any low or typhoid states of the system.

AQUA. WATER.

Aqua Distillata *Lond.* Distilled Water.

Prep. Made by distilling ordinary spring or rain water in a still, rejecting the first portion.

Prop. & Comp. A limpid colourless fluid, devoid of taste and smell, not altered by the addition of lime-water, chloride of barium, nitrate of silver, oxalate of ammonia, or sulphuretted hydrogen, indicating freedom from carbonic acid or carbonates, sulphates, chlorides and most organic matter, lime and ordinary metallic impurities, as copper, lead, &c. Composition (H O).

Use. It is ordered to be used in making all pharmaceutical preparations, but common water is frequently substituted; in some cases this neglect is important, as insoluble and inert compounds are formed, and the solvent power of distilled water for some substances exceeds that of common water.

Aquæ Minerales. Mineral Waters.

All water found on the earth's surface contains more or less foreign matter. The purest is melted snow or rain water, collected at a distance from towns. The most common impurities are salts of lime, as the sulphate, and the carbonate held in solution by an excess of carbonic acid. Besides these, water always contains a certain amount of gases dissolved in it, as common air, or rather air rich in oxygen and carbonic acid. The nature of the saline impurities varies much with the kind of soil through which the water flows; for some substances, as silex, are almost insoluble, whereas limestone and gypsum dissolve to a considerable amount, the former especially, when the water is impregnated with carbonic acid. When these foreign matters exist in the water to an extent sufficient to impart a sensible taste, it is called a mineral water: these have been divided into four classes, depending on their chemical composition.

The following are the most important :—

Class 1.—*Chalybeate or Ferruginous Waters.*

These waters owe their efficacy to the iron contained in

them; in many waters traces of iron exist, but such only are named chalybeate as possess sufficient of this metal to endow them with decided medicinal powers. In some springs, the iron exists in the form of carbonate held in suspension by excess of carbonic acid; when such are exposed to the air, peroxide of iron is soon formed and deposited: others contain sulphate of iron, often associated with sulphate of alumina, sometimes with chloride of iron.

The most important chalybeate waters, in which carbonate of iron is found, are those of Pyrmont, Spa, Schwalbach, Tunbridge Wells, and Harrowgate.

Iron exists as a sulphate in the waters of Sand Rock, Isle of Wight, Brighton, &c.

Therapeutics. Chalybeate waters are useful in anæmic conditions of the system; those containing the carbonate of iron are generally preferred, agreeing better with the stomach, and being less astringent. Individuals of plethoric habits should avoid chalybeate waters.

CLASS 2.—*Acidulous or Carbonated Waters.*

These waters contain a large amount of carbonic acid, which gives them their acidity, and causes them to sparkle; they usually hold in solution carbonates of lime, soda, and magnesia, which often become deposited on exposure from the escape of the carbonic acid, which acted as the solvent. The most celebrated of these waters are those of Carlsbad, Seltzer, and Ilkestone, near Nottingham.

Therapeutics. These waters are useful in atonic forms of dyspepsia, the free carbonic acid improving the tone of the stomach; they also, from the alkaline salts they possess, act as alteratives, increasing the secretion of the kidneys and skin, and are often valuable in chronic visceral diseases, gout, rheumatism, and some calcareous affections.

CLASS 3.—*Saline Waters.*

These waters contain various salts, as sulphates of soda, magnesia, and lime; chlorides of sodium, calcium, and magnesium; carbonates of lime and soda, &c. Hence they may be subdivided:

Some containing chiefly sulphates of magnesia and soda are named *purging saline waters*, as those of Cheltenham, Leamington, Epsom, Seidlitz and Püllna.

Some having carbonate and sulphate of lime for their principal ingredients are called *calcareous waters*, as those of Buxton, Bath, and Bristol.

Others contain chiefly chlorides, with, now and then, traces of iodine and bromine, called *salt waters*, as those of Weisbaden and Baden-Baden. Sea water also belongs to this division.

Lastly, some saline waters are noted for the amount of alkaline carbonates they contain, *alkaline waters*, as those of Vichy, Ems, and Malvern.

Therapeutics. The purging waters are indicated in cases where congestion of the portal system is present, whether from organic visceral disease or not; the calcareous waters in chronic gout and rheumatism, and some skin affections: they act as powerful stimulants and alteratives, increasing the urinary and cutaneous excretions: the simple saline waters are more adapted for scrofulous affections, as glandular enlargement, &c.; and the alkaline waters in gout, and urinary diseases connected with excessive formation of uric acid, as they tend to induce a less acid condition of urine.

CLASS 4.—*Sulphuretted or Hepatic Waters.*

All contain sulphuretted hydrogen in solution, and are readily known by their odour; the most celebrated are those of Harrowgate, Moffat, Cheltenham, Aix-la-Chapelle: some contain an alkaline sulphuret as well as sulphuretted hydrogen.

Therapeutics. These waters act as stimulants, especially on the skin and uterine system, and are used chiefly in chronic skin diseases, certain cases of chronic rheumatism and uterine affections, &c.

ACIDA. ACIDS.

(ALPHABETICALLY ARRANGED, INCLUDING SOME ACIDS FROM THE ORGANIC KINGDOM.)

Acidum Aceticum *Lond.* Acetic Acid, prepared from wood by distillation (purified).

Prep. When wood is heated in close vessels, as in iron retorts, amongst the volatile products of its destruction, a large amount of acetic acid distils over, mixed with wood spirit and various hydrocarbons; from this fluid, after redistillation, and neutralisation with carbonate of soda, acetate of soda is separated by crystallisation, and purified by several re-crystallisations; this salt heated with sulphuric acid and water yields acetic acid mixed with water, and forms the product under consideration.

Prop. & Comp. A colourless liquid of very pungent odour and strong acid taste, sp. gr. 1·048 Ph. Lond., contains 30·8 per cent. of real acid; is volatile, does not precipitate chloride of

barium or nitrate of silver; has no action on strips of metallic silver, and when neutralised with ammonia is not precipitated by sulphuretted hydrogen, ammonia, or ferrocyanide of potassium; these various tests indicating a freedom from sulphuric, hydrochloric, or nitric acids, and metallic impurities, especially copper: 100 grains of the acid are saturated by 87 grains of crystallised carbonate of soda; diluted with 6 parts of water it has the strength of ordinary vinegar. (The real acid, or acetate of water, has the composition (HO, C_4 H_3 O_3), crystallises at 59° Fah., and is called glacial acetic acid.)

Off. Prep. ACIDUM ACETICUM DILUTUM, LOND. Dilute Acetic Acid. (Acetic acid, f. ℥xxiij; distilled water, Oj. To the acid add as much water as may be necessary, that it may accurately fill a pint measure, and mix.) Its specific gravity is 1·008. A fluid ounce is saturated by 57 grains of the crystals of carbonate of soda. The strong acid is used in Acetum Cantharidis, Lond., and Oxymel, Lond.; and the diluted acid in Acetum Colchici, Lond., and Acetum Scillæ, Lond.

Therapeutics. When freely diluted, acetic acid, given internally, acts as a refrigerant, but is seldom employed for this purpose. Externally, in its strong form, it is used as a rubefacient; sometimes as a vesicant and escharotic; but the glacial acid is more effective for such purposes; and, much diluted, to sponge the surface in fevers, also in cooling lotions. Acetic acid is more frequently employed on account of its solvent powers, than for any therapeutic value it may possess.

Dose. Of acidum aceticum dilutum, f.ʒj to f.ʒiij diluted.

Adulteration. Foreign acids, and metallic impurities, as copper, detected by the above tests.

Acetum (Britannicum) *Lond.* Vinegar (British). Impure acetic acid, prepared from an infusion of malt by fermentation.

Prep. When an infusion of malt is fermented and afterwards exposed very freely to the action of air, the alcohol contained in it absorbs oxygen, and is converted into acetic acid which is contained in the vinegar. The change is thus shown: alcohol, (C_4 H_6 O_2)+O_4=acetic acid (HO, C_4 H_3 O_3)+2 HO.

Prop. & Comp. A brownish yellow liquid, having an agreeable acid odour and taste; sp. gr. 1·019; contains about 5 per cent. of real acid, together with colouring matter, mucilage, and a small amount, $\frac{1}{1000}$ part by weight, allowed by law, of sulphuric acid. A fluid ounce of vinegar is saturated by 60 grains of crystallised carbonate of soda; when 10 minims of the solution of chloride of barium (Lond.) are added to a f.℥j of vinegar,

and the deposit separated by filtration, the addition of more of the chloride causes no further precipitation, unless an illegal amount of sulphuric acid is present. Vinegar is not altered in colour by sulphuretted hydrogen unless metallic impurities are present.

Off. Prep. ACETUM DISTILLATUM, LOND. Distilled Vinegar. (Vinegar, a gallon, distil seven pints in a sand-bath.) Its sp. gr. is 1·0065. A fluid ounce is saturated by 57 grains of the crystals of carbonate of soda. Acetum is contained also in Liniment. Æruginis, Lond.

Therapeutics. The action of acetum is the same as that of dilute acetic acid of equal strength.

Dose. Of acetum, or acetum distillatum, f ʒj to f.ʒiij, diluted.

Adulteration. Excess of sulphuric acid may be added to vinegar, and metallic impurities may be present from the vessel in which it is kept; these may be detected by the tests above given.

Acidum Arseniosum *Lond.* Vide Preparation of Arsenic.

Acidum Benzoicum *Lond.* Vide Gum Benzoin.

Acidum Carbonicum. Carbonic Acid. (Solution in water.) Aerated water.

Prep. By acting upon carbonate of lime, as chalk, marble, &c , with dilute sulphuric acid, and passing the gas through water under pressure.

Prop. & Comp. Carbonic acid (CO_2) is a colourless gas, heavier than air, soluble in its own volume of water; the solubility much increased by pressure. The solution is acid in re-action, sparkling when exposed to air from the escape of the gas. Water containing this acid has the power of holding in solution carbonates of magnesia, lime, iron, &c.

Therapeutics. The gas, when existing in quantities above a very small amount in the air, acts as a narcotic poison, causing asphyxia; and directed in a stream upon a painful ulcerated surface, is stated to allay the pain. When taken in the stomach, aerated water diminishes irritability if present, and hence allays sickness; and carbonic acid is often given in the form of effervescing medicines made with an acid and bicarbonate of an alkali. The water may also be usefully employed in dissolving saline remedies, as phosphates, carbonates, &c., when it is desirable to continue their use for a lengthened period.

Much of such water is now prepared in the Gasogene apparatus, of English and French construction.

Acidum Citricum *Lond.* Citric Acid.

Prep. From the juice of lemons, limes, and other allied species, by neutralising the acid with chalk, to form a citrate of lime, purifying this and liberating the citric acid by means of sulphuric acid.

Prop. & Comp. Large transparent colourless crystals, right rhombic prisms, of an agreeable acid taste, decomposed by heat, soluble in water and spirit; the precipitate with acetate of lead is soluble in nitric acid. Citric acid does not render lime-water turbid (citrate of lime is, however, a sparingly soluble salt), and causes no precipitate with any salts of potash except the tartrate, from which it throws down the bitartrate: 100 grains of citric acid, dissolved in water, are saturated by 205·7 grains of crystallised carbonate of soda. Composition of the crystallised salt (3 Ho, $C_{12} H_5 O_{11}$ + HO) or (3 HO, $\overline{Ci}$ + HO). Citric acid being regarded as tribasic, 3 equivalents of the water act the part of base.

Therapeutics. Citric acid given internally appears to act as a refrigerant, that is, in some way or other diminishes the preternatural temperature of the body in febrile states of the system; it allays thirst and irritation of the skin.

Dose. Gr. x to ʒß or more dissolved in water and sweetened.

Adulteration. Traces of sulphuric acid may be present, also tartaric, both detected by the tests given above.

. **Acidum Gallicum,** *vide* Gallæ or Nut-galls.

Acidum Hydrochloricum *Lond.* Hydrochloric Acid, prepared from chloride of sodium; Muriatic Acid.

Prep. By the action of sulphuric acid and water on chloride of sodium (common salt) in a glass retort, sulphate of soda and hydrochloric acid are formed; the latter gas distils over, and is collected in a receiver containing water, which absorbs it rapidly.

Prop. & Comp. A colourless transparent liquid, with a suffocating odour, and very acrid sour taste, giving off white, acrid fumes when exposed to air; sp. gr. 1·16; entirely dissipated by heat; it consists of hydrochloric acid (H Cl.) dissolved in water.

It has no action on gold leaf, even when boiled with it, shown by the acid, after digestion on the metal, not giving any precipitate with protochloride of tin; nor does the acid decolorise a solution of sulphate of indigo: these tests indicating an absence of free chlorine. The diluted acid is not precipitated

by chloride of barium, ammonia, or sesquicarbonate of ammonia, indicating the absence of sulphates, and earthy or metallic matter. One hundred grains of the acid, of density 1·16, are saturated by 132 grains of crystallised carbonate of soda, and contain thirty-four per cent. of real hydrochloric acid.

Off. Prep. ACIDUM HYDROCHLORICUM DILUTUM, LOND. Dilute Hydrochloric Acid. (Hydrochloric acid, f.℥v; distilled water, f.℥xv; mix. Its sp. gr. is 1·043. A fluid ounce of this acid is saturated by 168 grs. of the crystals of carbonate of soda.)

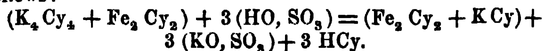
Therapeutics. Externally it acts as a powerful caustic, and acrid poison. Internally in a dilute form, as a refrigerant, tonic, and astringent. It is given in some forms of atonic dyspepsia, in low states of the system, as in the petechial form of exanthematous diseases. It is also used as a gargle in ulceration of the throat, and in diphtheritis.

Dose. Of acidum hydrochloricum dilutum ♏xv to ♏xl diluted.

Adulteration. Sulphuric acid, chlorine, and iron, for which the tests are given. The commercial acid is generally coloured from the presence of the latter impurities.

Acidum Hydrocyanicum Dilutum *Lond.* Diluted Hydrocyanic Acid, or Prussic Acid.

Prep. LOND. (Ferrocyanide of potassium ℥ij.; sulphuric acid, f.ʒvii; distilled water Ojß. Mix the acid with four fluid ounces of the water, and to these, placed in a retort, when they have cooled, add the ferrocyanide of potassium, first dissolved in half-a-pint of the water. Pour eight fluid ounces of water into a cooled receiver; then the retort being fitted on, let six fluid ounces of acid pass into this water distilled with a gentle heat in a second bath; lastly, add six more fluid ounces of distilled water, or as much as may be necessary, that 12·59 grains of nitrate of silver, dissolved in distilled water, may be accurately saturated by 100 grains of this acid.) The changes occurring in this process are rather complex, but in substance may be shown as follows: Ferrocyanide of potassium is a double cyanide of potassium and iron (2 KCy + FeCy + 3 HO); when acted upon by sulphuric acid and water, a portion of the cyanide of potassium of the salt is decomposed into hydrocyanic acid and sulphate of potash, and a salt containing two equivalents of cyanide of iron to one of cyanide of potassium, is left in the retort, called Everitt's yellow salt; the formula for the decomposition is as follows:



$$(K_4Cy_4 + Fe_2Cy_2) + 3(HO, SO_3) = (Fe_2Cy_2 + KCy) + 3(KO, SO_3) + 3\,HCy.$$

Anhydrous prussic acid can be prepared by passing sulphuretted hydrogen (hydrosulphuric acid) over bicyanide of mercury, bisulphuret of the metal and hydrocyanic acid being formed. Hydrocyanic acid is also produced when amygdaline, a principle contained in the bitter almond and the kernels of allied fruits, is decomposed by the action of water, and an albuminous principle contained in such fruit; *vide* Amygdala Amara.

Prop. & Comp. The dilute acid, prepared as above, is a colourless liquid of peculiar odour and taste, entirely volatilised by heat, of a very slight acid re-action, and the reddening produced on litmus paper, fugitive in character. It contains 2 per cent. of real or anhydrous acid (H, Cy).

The dilute acid, when pure, is not coloured by sulphuretted hydrogen or precipitated by chloride of barium, showing the absence of metallic taint or sulphuric acid, and no red colour is produced on the addition of the iodo-cyanide of potassium and mercury, showing the absence of any foreign acid.

The acid known under the name of Scheele's prussic acid contains 5 per cent. of anhydrous acid.

The anhydrous acid is colourless, with a more intense odour than the dilute, sp. gr. 0·697, very volatile, and rapidly decomposed into a carbonaceous-looking matter. The dilute acid can be much longer preserved when a little mineral acid is present, as a trace of sulphuric or hydrochloric acid.

Therapeutics. Anhydrous prussic acid is one of the most intense and rapid of poisons, acting as a direct sedative, apparently from arresting the functions of the whole body; its effects are the same whether taken into the stomach or applied to other mucous membranes, as to the eye, or inhaled as vapour.

When much diluted, and in medicinal doses, it allays pain and spasms, and if the dose be large, induces giddiness, &c. It is given in painful affections of the stomach and intestines, as in gastrodynia, enterodynia, pyrosis, and vomiting; also in chest affections, as pertussis, asthma, and other cases where the character of the cough is nervous; occasionally it is used to allay palpitation of the heart, especially when connected with dyspepsia, and it has been prescribed in epilepsy, chorea, and other diseases of the nervous system.

Externally applied it allays irritation of the skin, and when freely diluted may be used in the form of lotion in cutaneous affections accompanied with much itching: great care should be taken that the skin is not abraded.

Dose. Of acidum hydrocyanicum dilutum ♏ij. to ♏x. Scheele's acid is $2\frac{1}{2}$ times stronger.

In the form of lotion, f.ʒj or more may be added to Oss of water, lead lotion, or almond emulsion.

Incompatibles. It is often prescribed with alkalies, as liquor potassæ, &c.; then a cyanide of the metal is formed, which acts in the same manner; but if a salt of iron be also present, yellow prussiate or ferrocyanide of potassium is produced—a salt possessing none of the properties of prussic acid.

Acidum Hydro-Sulphuricum (recens præparatum) *Lond. Appendix.* Hydro-Sulphuric Acid (recently prepared).

Prep. By treating a metallic sulphuret, as sulphuret of iron, with dilute sulphuric acid, and passing the gas which is evolved into cold distilled water.

Prop. & Comp. A colourless liquid, having the odour of rotten eggs; gradually decomposing, especially when exposed to air and light, with the deposition of sulphur. It is a watery solution of hydrosulphuric acid, or sulphuretted hydrogen (H S).

Uses. Introduced only as a test. It possesses the property of throwing down most of the ordinary metals from acid solutions: the precipitate with arsenic is yellow; with antimony, orange; with cadmium, yellow; with mercury, lead, copper, and silver, black; with bismuth and gold, brownish-black, &c. Zinc is precipitated white, from a slightly alkaline solution.

Sulphuretted hydrogen is a constituent of some mineral waters. When the gas is inhaled undiluted, it acts as a poisonous sedative.

Acidum Nitricum *Lond.* Nitric Acid; Aqua fortis, prepared from nitrate of potash.

Prep. By the action of sulphuric acid in excess upon nitrate of potash in a glass retort, when nitric acid and bisulphate of potash are formed; the former, being volatile, distils over.

Prop. & Comp. A colourless transparent liquid, with strongly acrid odour, and intensely acid taste; sp. gr. 1·42, Ph. Lond.; can be brought up to 1·50; it fumes in the air, and entirely volatilises with heat. Composition ($H\,O, N\,O_5$) when pure; if of less density, contains more water. When diluted with three parts of water, it gives no precipitate, either with nitrate of silver, or chloride of barium. One hundred grains of the acid, of density 1·42, are saturated by 161 grains of crystallised carbonate of soda.

Off. Prep. Acidum Nitricum Dilutum, Lond. Dilute

Nitric Acid. (Nitric acid, f.℥iij; distilled water, f.℥xvij; mix.) Its sp. gr. is 1·082. A fluid ounce of this acid is saturated by 154 grains of the crystals of carbonate of soda.

Therapeutics. Externally, as a caustic, it is employed as an application to phagedenic sores, and for the destruction of warts, care being taken to protect the surrounding parts. In the diluted form, it has been used as an application to some ulcers, and diseases of the skin. Injected in a very dilute state into the bladder, it has proved effectual in the solution of phosphatic calculi. Internally it may be given as a refrigerant and tonic in cases similar to those for which sulphuric acid is administered, as in febrile diseases, and for preventing phosphatic deposits: it is also very useful in some forms of dyspepsia. But nitric acid seems to possess powers not connected with its acid properties, for in certain scrofulous states of the system, and in syphilis, occurring in such habits where mercury cannot be given, nitric acid often proves very serviceable. It is also given in some forms of cutaneous diseases.

Dose. Of the strong acid, ♏j to ♏v; of the dilute, ♏x to ♏xxx.

Adulteration. Chiefly sulphuric and hydrochloric acids, detected by the baryta and silver tests above given.

Acidum Nitro-Muriaticum *Dub.* Nitro-Muriatic or Nitro-Hydrochloric Acid. Aqua Regia.

Prep. By adding one fluid ounce of nitric acid to two fluid ounces of hydrochloric acid, in a green glass bottle well stoppered. It should be kept cool and in the dark.

Prop. & Comp. When nitric and hydrochloric acids are mixed, decomposition takes place, chlorine and nitric oxide being formed, and supposed to be in combination; the mixture dissolves gold from the chlorine present. It forms a deep yellow liquid, having a chlorine and nitrous odour.

Therapeutics. Similar to that of a solution of chlorine, used by some as a tonic and stomachic in dyspepsia; also in phosphatic deposits in the urine. It is thought to have a considerable influence over the action of the liver, and to possess alterative powers. Used in chronic hepatitis, syphilitic cachexia, &c. Externally it is used as a foot-bath in the above-named diseases.

Dose. ♏iij to ♏vj, freely diluted. As a bath, f.℥jß to each gallon of water (in a wooden vessel).

Acidum Phosphoricum Dilutum *Lond.* Diluted Phosphoric Acid.

Prep. Lond. (Phosphorus ʒvj; nitric acid, f.℥iv; distilled water, f.℥viij. To the acid mixed with water, placed in a retort in a sand-bath, add the phosphorus; then apply heat until six fluid ounces have distilled; put these again into the retort, that six fluid ounces may again distil, which are to be thrown away. Evaporate the remaining liquor in a capsule made of platina until only two ounces remain. Lastly, add to the acid, when it has cooled, as much distilled water as may be requisite to make it accurately measure a pint, and mix.) When nitric acid diluted with water acts with the aid of heat upon phosphorus in a glass retort, the acid is decomposed into oxygen, which unites with the phosphorus to form phosphoric acid, and nitric oxide gas which escapes; a portion of the nitric acid distils over, which is again returned into the body of the retort; the liquor at last remaining in the retort is then evaporated to a small quantity, in order to drive off any undecomposed nitric acid, and the syrupy solution of phosphoric acid afterwards diluted to the proper amount.

Prop. & Comp. As thus prepared, diluted phosphoric acid is a colourless liquid, without odour, of an agreeable acid taste; sp. gr. 1·064. It contains 8·7 per cent. tribasic phosphoric acid ($3\,HO, PO_5$) in solution in water. It does not precipitate chloride of barium or nitrate of silver, nor is it coloured by sulphuretted hydrogen either before or after strips of silver or copper have been digested in it, these tests showing the absence of sulphuric acid, chlorides, metallic impurities, or nitric acid. A fluid ounce is saturated by 132 grains of crystals of carbonate of soda, and no precipitate is caused unless the acid contains lime.

Therapeutics. Dilute phosphoric acid acts in a similar manner to dilute sulphuric acid, but is less powerfully astringent. It has been asserted to allay thirst in diabetes, and is supposed to exert an influence on the growth of osseous tumours.

Dose. ♏x to ♏xxx.

Adulteration. Sulphuric acid, hydrochloric acid, and metallic impurities detected by the above tests.

Acidum Silicicum, Silicic Acid, or Silica, is contained in the Pharmacopœia as

Silex Contritus Lond. Powdered Flint.

Prep. By heating flints to redness, plunging them into water, and afterwards reducing them to a fine powder.

Prop. & Comp. A white powder, tasteless, insoluble in water and acids, slightly acted upon by alkalies, and powerfully so by hydro-fluoric acid. Composition ($Si\ O_3$).

Use. As a mechanical agent for reducing volatile oils to a fine state of division in the preparation of some of the aquæ or waters of the Pharmacopœia; it has been substituted for magnesia, which acted injuriously upon the oils.

Acidum Sulphuricum *Lond.* Sulphuric Acid; Oil of Vitriol.

Prep. Made by burning sulphur with a little nitre in leaden chambers, when the sulphurous acid fumes coming in contact with nitrous acid and watery vapour, cause the higher oxidation of the sulphur, and formation of sulphuric acid; if sulphur is burnt without nitre, *sulphurous* acid is produced.

Prop. & Comp. An oily-looking colourless liquid; sp. gr. 1·843; having no odour, but intensely burning acid taste, chars most vegetable substances and becomes darkened, absorbs water rapidly, and when mixed with it evolves great heat. Composition (HO, SO_3). An anhydrous acid (SO_3) can be made. Diluted with an equal measure of water it generally gives a slight white precipitate of sulphate of lead (from the leaden chambers), which is held in solution by the strong acid; when diluted with 12 parts of water, it should give no yellow precipitate with sulphuretted hydrogen, indicating the absence of arsenic, &c.: 100 grains of the acid require for saturation 285 grains of crystallised carbonate of soda.

Off. Prep. Acidum Sulphuricum Dilutum, Lond. Diluted Sulphuric Acid. (Sulphuric acid, f. ℥xv; distilled water, Oj. Add by degrees the acid to Oß. of water, then pour in as much as may be necessary of the remaining water to make it accurately measure a pint, and mix.) Its sp. gr. is 1·103. A fluid ounce of this acid is saturated by 216 grains of the crystals of carbonate of soda. The dilute acid is contained in Infus. Rosæ Comp.

Therapeutics. Externally the strong acid is a most powerful caustic, rapidly destroying all the tissues with which it comes in contact; internally, when much diluted it acts as a refrigerant, tonic, and astringent. It is used to allay thirst in fever, especially when of a hectic character, to check excessive sweating in phthisis, to diminish passive mucous discharges, and hæmorrhages, to improve digestion, and brace up the system in debility. Given for some time it increases the acidity of the urine, and may be employed in phosphatic deposits. It has likewise been found serviceable in some chronic skin diseases connected with a low

state of system, as in pompholyx diutinus, &c. Recently it has been much extolled in checking diarrhœa. Externally, oil of vitriol rubbed up with lard is sometimes used as an ointment in very obstinate skin diseases, as in porrigo.

Dose. Of acidum sulphuricum dilutum, Lond., ♏v to ♏xxv, freely diluted.

Adulteration. Water, indicated by a lower specific gravity. Lead, detected on dilution; arsenic, from use of impure sulphur; and hydrochloric acid, from impurities in the nitre made use of. Oil of vitriol often becomes much discoloured from a trace of organic matters, such as wood, cork, &c.

Acidum Sulphurosum. Sulphurous Acid.

Prep. When sulphur is burnt in air, sulphurous acid is formed; but this acid is generally prepared by acting upon copper filings with strong sulphuric acid aided by heat, when the copper is oxidated by one part of the sulphuric acid, with the evolution of sulphurous acid, and a sulphate of the metal formed ($Cu + 2SO_3 = Cu\,O, SO_3 + SO_2$); for medicinal use a solution is made by passing the gas through water, which freely dissolves it.

Prop. & Comp. Water takes up 33 times its bulk of the gas: when fully saturated the solution is colourless, with the suffocating odour of burning sulphur; is a powerful deoxidising agent, liberating iodine from iodic acid, decomposing sulphuretted hydrogen, &c. Composition of sulphurous acid (SO_2).

Therapeutics. Sulphurous acid has a destructive influence on vegetable life, and upon this its therapeutic value probably for the most part depends. Externally applied, it causes irritation and redness, and has been used for the treatment of skin affections, especially when connected with vegetation, as porrigo. It may be used in solution, more or less diluted, or applied as vapour from burning sulphur.

Internally it is not often employed in the free state, the vapour being so suffocating in character; but the sulphite of soda is given in cases of chronic vomiting, depending on the presence of vegetation, *Sarcinæ ventriculi*, in the stomach, this salt slowly evolving sulphurous acid in that organ.

Dose. Of sulphite of soda ℈j to ʒj. A strong solution of the acid may be diluted with about an equal bulk of glycerine or some other liquid, and painted on the affected skin.

Acidum Tannicum, *vide* Gallæ, or Nut-Galls.

Acidum Tartaricum *Lond.* Tartaric Acid, crystallised.

Prep. From bitartrate of potash or cream of tartar, by the addition of chalk, whereby an insoluble tartrate of lime is formed with half the acid in the bitartrate, and a neutral tartrate of potash left in solution, the acid of which is afterwards formed into tartrate of lime by decomposition of the potash salt with chloride of calcium. Lastly, tartaric acid is separated from the purified tartrate of lime by decomposition with sulphuric acid.

Prop. & Comp. In white transparent crystals, which are oblique rhombic prisms, with a sour but agreeable taste, decomposed entirely by heat, soluble in water, the solution precipitating bitartrate of potash from any neutral salt of potash. It should not give a precipitate with chloride of barium, and any thrown down with acetate of lead is soluble in nitric acid. Composition ($2\,HO, C_8\,H_4\,O_{10}$) or ($2HO, \bar{T}$); the two equivalents of water are basic, tartaric acid being bibasic: 100 grains of the acid are saturated by 192 grains of crystallised carbonate of soda.

Therapeutics. Tartaric acid acts in the same way as citric acid, as a refrigerant in fevers, diminishing thirst: it is more commonly given for such purposes in the form of cream of tartar, or with bi-carbonate of soda, in an effervescing state.

Dose. Gr. x to ʒß or more, dissolved in water and sweetened.

Adulteration. Sulphuric acid may be present from the imperfect preparation. Bitartrate of potash and alum have occasionally been added. These latter would leave an ash when incinerated.

AMMONIA AND ITS SALTS.

(NH_3).

When pure, ammonia is a colourless gas, capable of being liquefied, of very pungent odour, the fumes producing an alkaline reaction; forms salts with acids, but always takes an atom of basic water, and hence by most chemists these are regarded as containing an oxide of a hypothetical metal called ammonium (NH_4); thus sal ammoniac may be regarded as a hydrochlorate of ammonia (NH_3,HCl) or chloride of ammonium (NH_4Cl). Ammonia also forms direct combinations with acids, as carbonic acid, not true salts; a compound of carbonic acid and ammonia (NH_3, CO_2) is found in the sesquicarbonate of the shops. Gaseous ammonia is sometimes made use of therapeutically, *see* Liquor Ammoniæ, in which it is contained, and from which it is evolved when so employed.

Ammoniæ Liquor Fortior *Lond.* Stronger Solution of Ammonia.

Ammoniæ Liquor *Lond.* Solution of Ammonia, the weaker solution.

Prep. Any salts of ammonia, such as those obtained from gas liquor or from the distillation of bones, are decomposed by quick-lime, and the ammonia (gas) passed into water, which absorbs it with intensity, and forms the solution of ammonia.

Prop. & Comp. The *stronger solution* has a sp. gr. 0·882, the *weaker* sp. gr. 0·960; the weaker is made from the stronger by the addition of distilled water, in the proportion of 2 ounces of the water to each ounce of the stronger solution. The solutions are colourless, giving off alkaline pungent fumes when exposed to air. No colour or precipitate should be produced by sulphuretted hydrogen or lime-water, showing the absence of most ordinary metallic impurities or carbonic acid, and when neutralised with nitric acid, should not precipitate with sesquicarbonate of ammonia, nitrate of silver, or chloride of barium, indicating freedom from earthy salts, chlorides, or sulphates. Liquor ammoniæ fortior contains nearly 30 per cent. of ammonia; Liquor ammoniæ nearly 10 per cent.

Off. Prep. Tinctura Ammoniæ Composita, Lond. Compound Tincture of Ammonia. (Mastic, ʒij; rectified spirit, f ʒix; oil of lavender ♏xiv; stronger solution of ammonia Oj. Macerate the mastic in the spirit, that it may be dissolved; pour off the tincture free from any sediment, then add the remaining ingredients, and shake all well together.) This tincture formerly contained amber, and was known by the name of Eau de luce.

Linimentum Ammoniæ, Lond. Liniment of Ammonia. (Solution of ammonia, f.℥j; olive oil, f.℥ij. Shake them together until they are mixed.)

Liquor Ammoniæ Fortior is also contained in Liniment. camphoræ comp. *Lond.*

Therapeutics. In medicinal doses free ammonia, as exhibited in any of its preparations, produces warmth at the epigastrium, and acts as an antacid; increases the force and frequency of the pulse, allays spasms, and promotes the secretions from the skin and mucous membranes, especially the bronchial. In larger doses throbbing and pain in the head, with heaviness, are induced; and in still larger medicinal doses, emetic effects; beyond this, poisonous irritant symptoms may be caused. The action of ammonia differs much from that of alcohol, probably influencing rather the ganglionic and spinal systems than the brain proper, and increasing the functions of the secreting and

excreting organs. It does not render the urine alkaline, but a portion appears in that fluid as nitric acid. Externally applied, ammonia is rubefacient, and even vesicant; inhaled as a gas, it is topically irritant.

Ammonia is given to rouse the system in syncope, &c., to diminish spasms in hysteria, to relieve nervous headache, the after-effects of alcohol, and in delirium tremens; also as a stimulant in low states of the system, as typhoid forms of fever; in pneumonia and bronchitis, in which latter the expectorant power is also useful; as a stimulant and antacid in low forms of dyspepsia connected with increased secretion of acid and flatulence in the stomach. Externally it is employed to the mucous membrane of the nose in syncope and insensibility (in such cases care should be taken not to use too strong solutions); also occasionally it is inhaled, *very much diluted*, as an expectorant in chronic bronchitis. On the skin it is used, combined with volatile or essential oils, in most cases where a counterirritant effect is desired to be produced by means of an embrocation, as over painful parts, stiff joints, &c. Liquor ammoniæ fortior, rubbed up with lard, will vesicate rapidly, if evaporation is prevented. Ammonia may be used with advantage in poisoning with prussic acid, digitalis, tobacco, colchicum, and other sedative drugs.

Dose. Of liq. ammoniæ (not fortior) ♏x to ♏xxx, well diluted; of tinct. ammoniæ comp. ♏v to ♏xx or more, well diluted.

Ammoniæ Sesquicarbonas *Lond.* Sesquicarbonate of Ammonia, crystallised.

Prep. By heating a mixture of hydrochlorate of ammonia and chalk, when chloride of calcium, and carbonate of ammonia, are formed, the latter rises in vapour and is condensed. The exact changes are not, however, quite so simple, for a neutral carbonate of ammonium is not the result, as will be seen below. It is sometimes made from sulphate of ammonia and chalk; the sulphate being formed by the addition of gypsum or sulphuric acid to gas liquors or bone spirit.

Prop. & Comp. Colourless, almost transparent, crystalline masses, with powerful ammoniacal odour and acrid taste; strongly alkaline, volatilises with heat, soluble in water, one part more than the rest; exposed to air the odour is dissipated, and a white opaque salt remains. Composition ($[NH_4O, CO_2 + HO, CO_2] + NH_3, CO_2$) or a compound of bi-carbonate of oxide of ammonium, the odourless, less soluble and less volatile salt, and a pungent compound of ammonia and carbonic acid,

which cannot be looked upon as a true salt of ammonia: when saturated with nitric acid, it is not precipitated by chloride of barium or nitrate of silver, showing the absence of sulphates and chlorides.

Off. Prep. LIQUOR AMMONIÆ SESQUICARBONATIS, LOND. Solution of Sesquicarbonate of Ammonia. (Sesquicarbonate of ammonia ℥iv; distilled water Oj. Dissolve and strain.)

LINIMENTUM AMMONIÆ SESQUICARBONATIS, LOND. Liniment of Sesquicarbonate of Ammonia. (Solution of sesquicarbonate of ammonia, f.℥j; olive oil, f.℥iij. Shake them together until they are mixed.)

Therapeutics. Sesquicarbonate of ammonia, when fresh, acts both internally and externally in the same manner as free ammonia (*vide* Liq. ammoniæ); occasionally, but very seldom, it is used as an emetic; when old or after exposure, it acts much less powerfully as an excitant, but resembles the other ammoniacal salts (*vide* Ammoniæ bicarbonas).

Dose. Of the salt, as a stimulant, gr. iij to gr. x or more. As an emetic ʒß may be given well diluted; occasionally useful as such in asthenic bronchitis with deficient expectoration. Of liquor ammoniæ sesquicarbonatis, f.ʒß to f.ʒj or more, diluted.

Adulteration. It may not contain the volatile pungent carbonate from previous exposure; sulphates or chlorides may be present, which are detected by the above tests.

Ammoniæ Bicarbonas *Dub.* Bi-carbonate of Ammonia.

Prep. By reducing the sesquicarbonate of ammonia to fine powder, spreading it out on a sheet of paper, and exposing it to the air for 24 hours, then keeping it in a well-stoppered bottle.

Prop. & Comp. A white powder when thus prepared, but it can be crystallised in six-sided prisms from a solution in water, of which, in the cold, about 8 parts are required; but very little ammoniacal odour, and saline, slightly pungent, taste. Composition ($N H_4 O, C O_2 + H O, C O_2$), or a carbonate of ammonia and carbonate of water.

Therapeutics. Very slightly stimulant and antispasmodic, but increases the capillary circulation and the secretions of the skin and mucous membranes. The author has recently employed it with apparent success in some forms of chronic rheumatism occurring in debilitated habits.

Dose. Gr. x to ʒß or more, dissolved in water, &c.

VOLATILE CARBONATE OF AMMONIA ($N H_3, C O_2$) exists in the two following preparations, which are often employed in medicine.

Spiritus Ammoniæ Aromaticus *Lond.* Aromatic Spirit of Ammonia, or Sal Volatile.

Prep. LOND. (Hydrochlorate of ammonia ℥vj; carbonate of potash ℥x; bruised cinnamon, bruised cloves, each ʒijß; lemon peel ℥v; rectified spirit, water, each Oiv. Mix and distil Ovj.) Carbonate of ammonia, chloride of potassium, and water are formed; the former distils over with the spirit and essential oils.

Prop. & Comp. A colourless liquid, of pungent aromatic and ammoniacal odour and taste; sp. gr. 0·918; contains the carbonate (NH_3, CO_2) dissolved in spirit, together with the essential oils of the aromatics employed.

Therapeutics. As the sesquicarbonate or free ammonia, more pleasant.

Dose. ♏xx to f. ʒj.

Spiritus Ammoniæ Fœtidus *Lond.* Fœtid Spirit of Ammonia.

Prep. LOND. (Hydrochlorate of ammonia ℥x; carbonate of potash ℥xvj; rectified spirit, water, each Oiij; assafœtida ℥v. Mix, then distil Oiij over a slow fire.) The same changes ensue as in the last preparation.

Prop. & Comp. As the last, except that the odour and taste are disagreeable, and oil of assafœtida is contained in place of that of cloves, &c; sp. gr. 0·861.

Therapeutics. As the last, but more powerfully antispasmodic.

Dose. ♏xx to f. ʒj.

Ammoniæ Hydrochloras *Lond.* Hydrochlorate of Ammonia; Sal Ammoniac.

Prep. Generally prepared from gas liquor, by adding hydrochloric acid to neutralisation, or by first forming a sulphate of ammonia, mixing this with common salt (chloride of sodium), and by heat subliming the hydrochlorate of ammonia (chloride of ammonium) from the sulphate of soda, and collecting in leaden domes. It may be also made from bone spirit.

Prop. & Comp. Hemispherical cakes, or pieces of such, which have a peculiar tough, fibrous structure; crystallises from solution in octohedrons: it is devoid of odour, but has a strong saline taste; soluble in water, the solution neutral: when treated with potash, soda, or lime, free ammonia is evolved.

Off. Prep. It is contained in Liquor Hydrargyri Bichloridi, *Lond.*, where it adds to the solubility of the mercurial salt: it

is also used in preparing spiritus ammoniæ aromaticus et fœtidus, *Lond.*, but not contained as such in them.

Therapeutics. Not well understood; has no primary stimulant action, but probably after absorption increases the secretions of skin and mucous membranes: by some considered cholagogue, and a substitute for mercurials in chronic inflammatory diseases, to cause absorption; by others it is regarded as emmenagogue; and there is good evidence of its action on the nervous system, seen in its power of relieving pain in different forms of neuralgia. Externally it is slightly stimulant, and supposed to have the power of discussing tumors. It is not much used in Great Britain, but has been extensively employed in Germany and Russia in neuralgia and chronic rheumatism, and as an alterative. Externally it is applied in lotions to swollen parts, as glandular enlargements, &c.; occasionally, from the cold produced during its solution, as a refrigerant to the head.

Dose. Gr. v to ʒß.

Adulteration. Iron and lead are apt to be present in the commercial salt, from the apparatus employed in its manufacture; the former may arise from sublimation of chloride of iron; it stains the salt red; neither sublime by moderate heat: the former is detected upon the addition of a few drops of nitre and (Pereira) by ferrocyanide of potassium, giving rise to prussian blue; the latter, by a solution of iodide of potassium. Sometimes chloride of calcium is present, causing it to deliquesce.

Liquor Ammoniæ Acetatis *Lond.* Solution of Acetate of Ammonia, called formerly Spirit of Mindererus.

Prep. LOND. (Dilute acetic acid Oj; sesquicarbonate of ammonia ʒix, or as much as may be necessary. Add the sesquicarbonate to the acid, to saturation.)

Prop. & Comp. A colourless solution, having no odour, with mild saline taste; sp. gr. 1·022; neutral in re-action; consists of acetate of ammonia ($N\,H_4\,O, \bar{A}$), dissolved in water; treated with potash, it evolves ammonia, and with sulphuric acid, acetic vapours. It should not be coloured by sulphuretted hydrogen, nor precipitated by chloride of barium; and should nitrate of silver throw down a precipitate, it is re-dissolved by water or nitric acid. When evaporated, the salt which remains is entirely volatilised by heat.

Therapeutics. Not a topical stimulant, as free ammonia and the carbonate, but it increases the secretions, especially of the skin, sometimes of the kidneys also; it is very commonly used

in the treatment of febrile states of the system, as a diaphoretic and refrigerant. It is stated to relieve painful menstruation when given in large doses.

Dose. f.ʒj to f.℥ß, diluted, or more in dysmenorrhœa.

Adulteration. It should not contain free acid or alkali, nor be given with fixed alkalies, lime, or magnesia, as ammonia is then set free.

Liquor Ammoniæ Citratis *Lond.* Solution of Citrate of Ammonia.

Prep. LOND. (Citric acid ℥iij; distilled water Oj; sesquicarbonate of ammonia ℥ijß, or as much as may be necessary. Dissolve the acid in the water, and add the sesquicarbonate to saturation.)

Prop. & Comp. A colourless liquid, similar in most of its properties to that of the acetate; neutral; contains citrate of ammonia ($3.NH_4O, \bar{C}i$) dissolved in water; but this salt during evaporation is decomposed, and an acid salt left.

Therapeutics. The same as the solution of acetate of ammonia, possibly less diaphoretic; used as a refrigerant in fevers.

Dose. ʒß to ʒij.

A solution of *tartrate of ammonia* can be made by a similar method; it has the same physical characters and therapeutic effects as the acetate and citrate.

Ammoniæ Oxalas *Lond. Appendix.* Oxalate of Ammonia, crystallised.

Prep. By neutralising a solution of oxalic acid by means of sesquicarbonate of ammonia, subsequent evaporation and crystallisation.

Prop. & Comp. & Use. Colourless prismatic crystals; without odour; soluble in water. Composition ($NH_4O, C_2O_3 + HO$). It is introduced into the Pharmacopœia, to be used in solution as a test for the detection of lime, and its separation from magnesia. It is a poisonous salt.

Ammoniæ Hydro-Sulphuretum *Dub.* Hydro-Sulphate of Ammonia, or Sulphuret of Ammonium.

Prep. Ordered by the Dublin College to be made by passing sulphuretted hydrogen gas through a solution of ammonia to saturation.

Prop. & Comp. A greenish-yellow transparent liquid, with intensely disagreeable and pungent odour. Sp. gr. 0·999. Often used as a test, as it precipitates many metals. Composition of

the salt (NH_4 S+SH), or a compound of sulphuret of ammonium and sulphuretted hydrogen.

Therapeutics. In large doses it acts as a powerful depressant on the nervous system, causing giddiness, drowsiness, and faintness, with nausea; in smaller ones it produces upon the secreting organs increased action, more especially seen on the bronchial mucous membrane and skin. It is used occasionally as a sudorific and expectorant in chronic skin diseases, rheumatism, and bronchitis; also in diabetes, in which it has been stated to diminish the morbid appetite, but it does not prevent the excretion of sugar. Dangerous if given incautiously, and not much employed.

Dose. ♏iij. upwards, carefully increased, dropped into water at the time of administration, as it soon decomposes and deposits sulphur.

Incompatibles. Almost all metallic and acid solutions.

METALLIC PREPARATIONS (ALPHABETICALLY ARRANGED).

ALUMINUM.

(AL. EQ.=14.)

This metal does not exist native, but is formed artificially from certain of the compounds. It has a steel-grey colour, sp. gr. 2·67, and is not readily oxidised. It forms only one oxide (Al_2 O_3), a very weak base, which occurs pure in the sapphire, and combined with silica in clay, schists, &c.

Alumen *Lond.* Sulphate of Alumina and Potash, crystallised.

Prep. Usually made by burning alum schist, which contains metallic sulphurets as well as alumina, subsequent exposure to air, by which means sulphuric acid is formed, which unites with the alumina, and the after-addition of sulphate of potash to the solution, and crystallisation.

Prop. & Comp. Alum is a double sulphate of alumina and potassa (KO, SO_3+Al_2 O_3, 3SO_3+24HO); forms transparent white crystals, regular octohedrons; slightly efflorescent in dry air, from a loss of some of its water, the whole of which is driven off by heat, leaving a white spongy mass; soluble in 18

parts of water at 60° Fah., in less than its own weight of boiling water: the alumina is precipitated by alkalies, and their carbonates, but re-dissolved by excess of the former.

Off. Prep. ALUMEN EXSICCATUM, LOND. Burnt Alum. (Alum ℔j; liquefy the alum over a fire; then let the heat be increased until all ebullition has ceased.) It is simply alum deprived of its water of crystallisation.

LIQUOR ALUMINIS COMPOSITUS, LOND. Compound Solution of Alum. (Alum, sulphate of zinc, each ℥j; distilled water, Oiij. Rub the alum and sulphate together; dissolve them in water, and strain.)

Therapeutics. Alum acts as a topical astringent, and if applied as alumen exsiccatum, or burnt alum, it is a slight escharotic. Internally it acts upon the mucous membrane of the stomach and intestines, is afterwards absorbed, and produces remote astringent effects on the various secreting and other organs. In large doses it is a purgative. It is employed topically as a gargle or injection in sore throat, leucorrhœa, &c.; internally in hæmorrhages and passive discharges; sometimes in colica pictorum as a purgative. Alum has also gained repute in the treatment of hooping-cough.

Dose. Of alum, gr. x to ʒß as an astringent, alone or combined with kino, &c.; ʒj may be given as a purgative. The official preparations are used for external use only.

Incompatibles. Alkalies and their carbonates, tannin, or infusions and decoctions containing it, tartrates, salts of lead, baryta, lime, cause precipitates in solutions of alum.

ANTIMONIUM. ANTIMONY.

(SB. EQ. = 129.)

This element is not employed in its metallic state in medicine; all the preparations are prepared from the native tersulphuret, the most abundant ore. The symbol Sb. is derived from *Stibium*, another Latin name for Antimony.

Antimonii Tersulphuretum *Lond.* Tersulphuret of Antimony.

Prep. Made by fusing the ore, to separate it from impurities.

Prop. & Comp. It occurs in crystalline metallic-looking masses, which have a striated appearance, and are of a steel-grey colour ($Sb\,S_3$), soluble in boiling hydrochloric acid; giving off sulphuretted hydrogen: the solution of the chloride is pre-

cipitated, when thrown into water, as a white oxychloride of antimony.

Off. Prep. Not used as a drug, but employed in the preparation of the oxysulphuret, tartar emetic, and compound powder of antimony.

Antimonii Oxysulphuretum *Lond.* The Oxysulphuret of Antimony.

Prep. LOND. (Tersulphuret of antimony, powdered ℥vij; solution of soda Oiv; distilled water 2 gallons; dilute sulphuric acid, as much as may be necessary. Mix the tersulphuret and soda with the water; boil over a slow fire for 2 hours, constantly stirring, distilled water being often poured in that it may fill nearly the same measure. Strain the solution, and drop into it gradually as much diluted sulphuric acid as may be necessary to throw down the oxysulphuret of antimony; then wash away the sulphate of soda with water, and dry what remains with a gentle heat.)

Prop. & Comp. Bright orange or golden red powder, without odour and slight taste; insoluble in water, almost entirely soluble in hot hydrochloric acid with evolution of sulphuretted hydrogen, little sulphur remaining; also dissolved by caustic alkaline solutions. Composition ($Sb\ O_3 + 5.\ Sb\ S_3 + 15\ H\ O$); a mixed oxide and sulphuret, probably not a true chemical compound.

Off. Prep. It forms a part of Pil. Hydrargyri Chloridi Comp. *Lond.*

Therapeutics. It possesses the same properties as other antimonial preparations, *vide* Antimonii Potassio-tartras; is rather uncertain in action from its little solubility, and is seldom used except as an alterative in the compound calomel pill.

Dose. Gr. j to gr. v as an alterative; gr. x and upwards are emetic (not used as such).

Antimonii Potassio-Tartras *Lond.* Potassio-Tartrate of Antimony, or Tartar Emetic.

Prep. LOND. (Tersulphuret of antimony reduced to the finest powder ℔j; sulphuric acid, f.℥xv; bitartrate of potash ℥x; distilled water Ov. Mix the tersulphuret with the acid in an iron vessel; to these apply a slow fire under a chimney, frequently stirring with an iron spatula; then increase the fire until the flame of the ignited sulphur being extinguished, nothing remains but a whitish powdery mass. When this has cooled, wash it with water until no acid can be detected, and dry. Accurately mix 9 ounces of this salt with the bitartrate, and

boil in water for half-an-hour. Filter the solution while hot, and set aside that crystals may form. Having decanted the fluid, dry the crystals, and again evaporate the solution that re-crystallisation may take place.)

Prop. & Comp. Colourless rhombic octohedrons, with slight metallic taste. Composition (K O, Sb O_3 $\bar{T}$+3 HO); effloresces slightly in dry air; soluble in about 15 parts of cold water, in 2 parts of boiling water; insoluble in alcohol: the watery solution decomposes readily with the formation of algæ; is precipitated orange-red by sulphuretted hydrogen, not by ferrocyanide of potassium, chloride of barium, or nitrate of silver unless the solution is concentrated. Nitric acid gives a precipitate soluble in excess of the acid. 100 grains dissolved in water give with sulphuretted hydrogen 49 grains of tersulphuret of antimony.

Off. Prep. VINUM ANTIMONII POTASSIO-TARTRATIS, LOND. Antimonial Wine. (Crystals of potassio-tartrate of antimony ℈ij; sherry wine Oj. Rub the crystals into powder, and dissolve.) Two grains of the salt are contained in each ounce of the wine.

UNGUENTUM ANTIMONII POTASSIO-TARTRATIS, LOND. Tartar-emetic Ointment. (Potassio-tartrate of antimony rubbed to very fine powder ℥j; lard ℥iv. Rub together.)

Therapeutics. Internally, in small doses, tartar emetic acts on the skin and mucous membranes, and is diaphoretic, expectorant, probably cholagogue. In larger doses it acts at first as an emetic, sometimes as a purgative; if continued, tolerance becomes established, and it then produces a powerful sedative effect upon the vascular system (not the heart especially) and upon all the muscles. Externally it is powerfully irritant, and produces pustules having the character of those in Variola; occasionally when thus applied it becomes absorbed, and hence may be dangerous in very young subjects. Tartar emetic is used in febrile affections to promote secretions; in severe inflammation, as in acute pneumonia and bronchitis, as a vascular depressant; also in the reduction of dislocations; not unfrequently as an addition to purgative medicines. It is frequently employed as an emetic, being adapted to cases in which depression of the circulation is not objectionable. Externally, in the form of ointment, or hot aqueous solution, it is used as a powerful counter-irritant in head and abdominal affections, over diseased joints, and in other chronic inflammatory affections.

Dose. Of tartar emetic; as a diaphoretic, &c., gr. $\frac{1}{16}$ to gr. $\frac{1}{6}$; as a depressant or sedative, gr. $\frac{1}{6}$ to gr. ij; as an emetic, gr. j to gr. iij.

The wine is objectionable in cases where large doses are required for the depressant effect, but is a useful form in doses of ♏xv to ♏xl in febrile affections, &c.

Incompatibles. Acids, alkalies and their carbonates precipitate the solutions of this salt; also some earthy and metallic salts, as those of lime, lead, &c. Astringent solutions throw down an insoluble tannate.

Adulteration. Cream of tartar is the only adulteration likely to be met with, which can be detected by being less soluble in water than tartar emetic, and by finding that upon the addition of a small quantity of carbonate of soda to a boiling solution of the suspected salt, the precipitate of oxide of antimony, which is at first thrown down, becomes redissolved from the presence of the free acid of the bitartrate of potash.

Pulvis Antimonii Compositus *Lond.* Antimonial Powder.

Prep. LOND. (Tersulphuret of antimony, powdered, ℔j; horn shaving, ℔ij. Mix and throw into a red-hot crucible, and stir constantly until vapour no longer rises; beat what remains into powder, and put it into a crucible; then apply heat, and increase it gradually that it may continue red hot for two hours: rub the residue into a very fine powder.) In this process the hartshorn shavings are burnt, leaving only the ash, phosphate and carbonate of lime; the sulphuret of antimony is also changed into the oxides of antimony, which are mixed with the earthy salts.

Prop. & Comp. It is a dull white powder, inodorous and tasteless, insoluble in water, partly soluble in acids; it appears to consist of the earthy salts above mentioned, together with teroxide of antimony ($Sb\ O_3$) and antimonic acid ($Sb\ O_5$); a mixture or compound of these two has been called antimonious acid: the teroxide is soluble in acid solutions.

Therapeutics. This preparation was made to imitate *James' powder;* its action is uncertain, owing to its slight solubility, and to the varying amount of teroxide of antimony: it is not often used, except when the diaphoretic or slightly alterative action of the remedy is required, and is not relied on when the sedative effect on the vascular system is desired.

Dose. Gr. iij to gr. x.

ARGENTUM. SILVER.

(AG. EQ.=108.)

Argentum *Lond. Appendix.* Metallic Silver.

Silver is not used as a medicine in its metallic state, but only introduced as a test; when pure, it is very white and malleable, sp. gr. 10·50, acted on readily by sulphuretted hydrogen, and becomes black, but is not oxidised in the air: soluble in nitric acid, and used to detect this acid if present in acetic acid (see Acidum Aceticum); silver leaf is the form made use of for this purpose.

Argenti Nitras *Lond.* Fused Nitrate of Silver.

Argenti Nitras, Crystalli, *Lond. Appendix.* Nitrate of Silver, in crystals.

Prep. Made by dissolving silver in nitric acid, evaporating the solution, and crystallising, or by evaporating to dryness, fusing and running it into iron moulds.

Prop. & Comp. Nitrate of silver ($Ag\,O, N\,O_5$), when crystallised, is in colourless right rhombic prisms; when fused, in the form of small white pencils or sticks, crystalline in structure. It is soluble in its own weight of water at 60° Fah., insoluble in alcohol, stains the skin black, and forms insoluble compounds with animal tissues. It should be kept from the light.

Off. Prep. LIQUOR ARGENTI NITRATIS, LOND. APPENDIX. Solution of nitrate of silver (crystals of nitrate of silver ʒj; distilled water, f.℥j.; dissolve and strain). Used as a test; also as an external application, but is then diluted. It is precipitated by chlorides curdy white, soluble in ammonia, but insoluble in hot nitric acid; also by cyanides, white; by iodides, yellow; by alkalies, brownish black, soluble in ammonia; and black also by sulphuretted hydrogen.

Therapeutics. Externally it is astringent, irritant, vesicant, or even escharotic, according to the mode of its application; it may be used in solution from gr. ½ to ʒss to f.℥j, or in the solid form. Internally, in small doses, it acts as an astringent and alterative to the mucous membrane of the stomach and intestines, is absorbed and produces astringent effect, and also influences the nervous system as a tonic; when long continued, may stain the surface of the body of a blue or leaden hue; has not been known to do so under three months' continuous administration.

It is used to poisoned wounds, pustules, ulcers, venereal and other, erysipelatous parts, and to diminish or destroy morbid growths. Occasionally rubbed on the skin, to produce vesication; and in solutions of different strengths, used as a lotion, injection, or collyrium. Internally, often of great value in gastric affections of a chronic inflammatory character, accompanied by gastrodynia, pyrosis, or vomiting; also in certain forms of diarrhœa; and as a nervous tonic in chorea and epilepsy.

Dose. Gr. ¼ to gr. ½ or more, made into a pill with crumb of bread or some ingredient which does not decompose the salt.

Incompatibles. The solution should be made with distilled water, as the chlorides decompose it; it is seldom given in such a form on account of its very disagreeable taste, and decomposing almost all vegetable infusions, which could be prescribed with it; probably the chloride of silver and other insoluble compounds would act therapeutically.

Adulteration. Apt to contain copper and lead, or, when fused, nitrate of potash: if the former, its solution, after complete precipitation by salt, will be blackened by sulphuretted hydrogen; if lead, the precipitate is not entirely dissolved by ammonia; if nitre or any other substance, then 17 grains of the silver salt will not be sufficient to precipitate entirely 6 grains of common salt.

Argenti Oxidum *Dub.* Oxide of Silver.

Prep. By precipitating a solution of nitrate of silver by means of caustic potash, or, as the Dublin College orders, lime-water, then washing and carefully drying at a heat not exceeding 212° F.

Prop. & Comp. A dark brown powder, becoming blacker by age; insoluble in water, but soluble in ammonia and acids; readily decomposed by heat, and even by the action of light, when long continued, into metallic silver and oxygen. Composition (Ag O).

Therapeutics. Very similar to the nitrate, except that the topical action is slight; after absorption, its effects are probably the same. It has been asserted to be very valuable in hæmorrhages as an astringent. It may be used when the remote action of silver is required, as in diseases of the nervous system.

Dose. Gr. ½ to gr. ij., in the form of pill.

The *chloride of silver* has also been given as a remedy: its action is similar to that of the oxide.

ARSENICUM. ARSENIC.

(As. Eq.=75.)

It occurs chiefly as Arseniurets of iron, nickel, or cobalt. Metallic arsenic is not employed in medicine; when pure, it is steel-coloured, with metallic lustre, crystalline, and brittle; sp. gr. 5·8; very volatile, and when heated gives off an odour like garlic; forms with oxygen two acids, and combines readily with sulphur.

Acidum Arseniosum *Lond.* Arsenious Acid.

Prep. Usually collected in flues during the smelting of the arseniurets, and is afterwards re-sublimed to purify it.

Prop. & Comp. Usually in broken pieces of the cakes, into which form it had been sublimed; transparent and glass-like at first, but becomes opaque white or yellowish; soluble in about 100 parts of cold water—much more in boiling water, which, on cooling, deposits octohedral crystals of the acid; when sublimed by heat in a tube, the same octohedral crystals are seen. When mixed with charcoal and heated, metallic arsenic sublimes with the alliaceous odour. The solution is precipitated yellow by sulphuretted hydrogen, and lemon-colour by ammonio-nitrate of silver, and green with sulphate of copper, after the addition of potash. 100 grains should give 124 of tersulphuret of arsenic (orpiment) when precipitated with sulphuretted hydrogen in an acid solution.

Off. Prep. LIQUOR POTASSÆ ARSENITIS, LOND. Solution of Arsenite of Potash. (Arsenious acid, broken into small pieces, carbonate of potash, each, gr. lxxx; compound tincture of lavender, f. ʒv; distilled water, Oj. Boil the acid and carbonate with Oß of water, until they are dissolved. To the cold liquor add the tincture; and lastly, as much of the water as may be requisite, that it may accurately measure a pint.) This solution, formerly known as Fowler's Solution, contains, probably, arsenious acid, rendered more soluble in the alkaline solution; 4 grains of arsenious acid are contained in each fluid ounce.

LIQUOR ARSENICI CHLORIDI, LOND. Solution of Chloride of Arsenic. (Arsenious acid, broken into small pieces, ʒß; hydrochloric acid, f. ʒjß; distilled water, Oj. Boil the arsenious acid with the hydrochloric acid, mixed with an ounce of water until it be dissolved; then add as much water as may be necessary, so that it may accurately measure a pint.) Only a solution of the arsenious acid in hydrochloric acid, which renders it more soluble. It contains gr. 1½ of arsenious acid in the fluid ounce.

Therapeutics. In very minute doses its effects appear to be directed to the skin and nervous system, acting as an alterative and tonic: in larger, irritation of the alimentary canal and of the mucous membrane of the eyes is produced; in still larger, poisonous effects ensue: externally, it acts as an escharotic, and may be absorbed to a dangerous extent. It is employed internally in chronic skin affections, more especially when of a squamous or tubercular character; also as an antiperiodic in agues and neuralgic affections; and in chorea and epilepsy sometimes it is more effectual than quinine.

Dose. Of liq. potassæ arsenitis ♏iij to ♏x, or more. Of liq. arsenici chloridi ♏viij to ♏xxv. Preparations of arsenic should be given soon after a meal, and pain in epigastrium, nausea, and irritation of eyelids, looked upon as indications for diminishing the dose.

Adulteration. Gypsum and chalk, which have been sometimes mixed with arsenious acid, can be readily detected by not subliming with heat.

Arsenici et Hydrargyri Hydriodatis Liquor *Dub.* Liquor of Hydriodate of Arsenic and Mercury; Donovan's Solution.

Prep. Dub. (Pure arsenic, in fine powder, grs. vj; pure mercury, gr. xvj; pure iodine, gr. Lℨ; alcohol, f.ʒß; distilled water, ℥ix or a sufficient quantity. Rub together the arsenic, mercury, iodine, and spirit, until a dry mass is obtained, and, having triturated 8 ounces of the water with this in successive portions, let the whole be transferred to a flask, and heated until it begins to boil. When cooled and filtered, let as much distilled water be added to it as will make the bulk of the solution exactly 8 fluid ounces and 6 drachms.)

Prop. & Comp. A very pale greenish-coloured liquid, having no odour, but a styptic taste; it probably contains the biniodide of mercury ($Hg\,I_2$) and ter-iodide of arsenic ($As\,I_3$).

Therapeutics. It has been used chiefly in obstinate skin affections, and seems occasionally to be useful when other preparations of arsenic fail; it is peculiarly applicable to those depending on venereal taint. Externally, freely diluted, it has been used as a lotion in similar cases.

Dose. ♏x to f.ʒß diluted, and given with the precautions enjoined for the other preparations of arsenic. Each f.ʒ contains about gr. $\frac{1}{8}$ of arsenic (estimated as arsenious acid).

AURUM. GOLD.

(Au. Eq.=199.)

Aurum *Lond. Appendix.* Gold. The leaf form is used.

Gold, when pure, is a soft, malleable, yellow metal; sp. gr. 19·5; introduced into the Pharmacopœia only as a test: it is not acted on by nitric or any other simple acid, only by free chlorine, and is used to detect the presence of that body in hydrochloric acid.

Therapeutics. Gold in a state of very minute division (Pulvis Auri), or of the ter-oxide ($Au\,O_3$) or ter-chloride ($Au\,Cl_3$), has been employed in medicine, and appears to act in a very similar manner to mercury; its use has been chiefly confined to the treatment of venereal and scrofulous affections; as yet its powers have not been well made out. The preparation most employed is a double chloride of gold and sodium ($Au\,Cl_3$, $Na\,Cl + 4\,HO$), which occurs as an orange-coloured salt in quadrangular prisms. Leaf gold is much used by dentists for stopping teeth.

Dose. Of powdered gold, gr. $\frac{1}{4}$ to gr. j; of ter-oxide, gr. $\frac{1}{10}$ upwards; of ter-chloride or double salt, gr. $\frac{1}{20}$ upwards. The chloride is very poisonous, acting in a manner similar to corrosive sublimate.

BARIUM.

(Ba. Eq.=69.)

The metallic base of the Baryta salts, when separated, appearing as a brilliant white metal.

Barii Chloridum *Lond. Appendix.* Chloride of Barium, in crystals.

Prep. By acting on the carbonate of baryta (Witherite) by means of hydrochloric acid assisted by heat.

Prop. & Comp. Flat rectangular, white, transparent crystals, with bevelled edges; taste acrid and disagreeable; pretty soluble in water. Composition of crystals ($Ba\,Cl + 2\,HO$.)

Off. Prep. Liquor Barii Chloridi, Lond. Appendix. Solution of Chloride of Barium. (Chloride of barium ʒj; distilled water, f. ℥j. Dissolve and filter.)

Use. Chloride of barium is introduced into the Pharmacopœia as a test for detecting the presence of sulphuric acid or sulphates in solution; the precipitated sulphate of baryta forms a heavy white powder, insoluble even in boiling nitric acid.

Chloride of Barium has been employed in medicine, and in small doses appears to act as an alterative, especially affecting the glandular system; it is, however, a very poisonous salt, and not now used therapeutically.

BISMUTHUM. BISMUTH.

(Bi. Eq.=213.)

Bismuthum *Lond.* Metallic Bismuth.

Description. A pinkish white metal, occurring native, fusing readily, and crystallising in cubes or octohedrons; sp. gr. 9·8; soluble in nitric acid, precipitated by water: introduced only for the formation of the nitrate.

Bismuthi Nitras *Lond.* Nitrate of Bismuth.

Prep. Lond. (Bismuth ℥j; nitric acid, f.℥jß; distilled water Oiij. Mix f.℥j of the water with the acid; having added the bismuth, apply heat until it be dissolved. Pour the solution into the rest of the water, and strain the mixture through linen, that the powder may be separated. Wash this with distilled water, and dry with a gentle heat.)

The solution of Bismuth in nitric acid, on the addition of water, lets fall a salt now called in the London Pharmacopœia the Nitrate of Bismuth, formerly the tris-nitrate or sub-nitrate, the old equivalent of the metal (71) having been tripled by some recent chemists: the solution in nitric acid must, therefore, be considered as containing a ter-nitrate; the precipitate has, however, more the character of a sub-salt.

Prop. & Comp. A heavy white powder, sometimes pearly or crystalline. Composition (BiO, NO_5), but a little water is contained in it when prepared as above directed: its composition is also somewhat altered by washing. It is blackened by sulphuretted hydrogen, insoluble in water; dissolves without effervescence in nitric acid, and the solution is not precipitated by sulphuric acid.

Therapeutics. It acts as a sedative to the stomach and intestines, and is used with great effect in pyrosis, and some forms of vomiting; also to restrain diarrhœa, especially when phthisical in character: its remote effects are not well made out. Externally it is stated to allay irritation, and it has been used in some chronic skin diseases. It is also employed as a cosmetic.

Dose. Gr. v to ℈j in powder; or suspended by means of mucilage of gum arabic or tragacanth.

Adulteration. Carbonate of lead, a dangerous addition, known by the tests given above; this salt effervesces with nitric acid, and the solution is precipitated by sulphuric acid.

CALCIUM.

(CA. EQ.=20.)

Calcium is the metallic base of lime; it occurs, when pure, as a white metal, which, when heated, oxidises rapidly and is converted into lime.

Calx *Lond.* Lime, recently prepared from Chalk.

Prep. Lime, or quick-lime, is made from chalk or carbonate of lime by strongly heating it, so as to drive off the carbonic acid.

Prop. & Comp. It occurs in whitish masses, quite white when pure; of a caustic taste; rapidly absorbing water and becoming hydrated or slaked; also carbonic acid, and re-forming chalk. When water is added, it cracks and becomes pulverulent. About 11 grains are dissolved by a pint of water at 60° F.; it is less soluble in boiling water. The solution, or liquor calcis, soon absorbs carbonic acid if exposed to the air; lime dissolves in dilute hydrochloric acid without effervescence, and the solution, on the addition of ammonia, gives no precipitate.

Off. Prep. LIQUOR CALCIS, LOND. Lime Water. (Lime ℔ß; distilled water Oxij. Upon the lime, first slaked with a little of the water, pour the remainder and shake them together; immediately cover the vessel, and set it aside for three hours. Keep the solution, with the remaining lime, in stoppered glass vessels; and when it is to be used, decant from the clear solution.)

LINIMENTUM CALCIS, LOND. Liniment of Lime. (Lime-water, olive oil, each, f.℥x; shake them together until they are mixed.)

It forms also the half part of Potassa cum Calce, *Lond.*

Therapeutics. Lime is only given as liquor calcis, which acts as an antacid both on the intestinal canal, and, after absorption, on the blood and secretions. It differs, however, from potash and soda, in being astringent or desiccative, causing deficient secretion, and hence is very useful in diarrhœa connected with acidity, and in some cases of dyspepsia; it has also been used in certain calculous affections. Externally applied, lime acts as a caustic, or, much diluted, as a desiccative, and is applied to burns in the form of linimentum calcis.

Dose. Of liquor calcis, f.℥ß to f.℥ij or more, with milk, &c.

Adulteration. Lime and liquor calcis are apt to contain carbonic acid and metallic impurities, which can be detected by the tests given above.

Creta Præparata *Lond.* Friable carbonate of lime reduced to a very fine powder and elutriated; Prepared Chalk.

Prop. & Comp. A white powder, or small friable masses, tasteless, insoluble in water; entirely soluble, with effervescence, in dilute hydrochloric acid; if pure, the solution is not precipitated by sulphuretted hydrogen, nor, after boiling, by ammonia or lime-water added in excess, indicating the absence of silica, common metallic impurity, or of alumina or magnesia. Composition (CaO, CO_2).

Off. Prep. Confectio Aromatica, Lond. Aromatic Confection. (Cinnamon, nutmeg, of each ℥ij; clove ℥j; cardamom ℥ß; saffron ℥ij; prepared chalk ℥xvj; sugar ℔ij; distilled water, as much as may be necessary. Rub the dry ingredients together to a very fine powder, and keep them in a closed vessel. Whenever the confection is to be used, to each ounce of the powder add two fluid drachms of water, and mix all the ingredients together until they be thoroughly incorporated.)

Mistura Cretæ *Lond.* Chalk Mixture. (Prepared chalk, ℥ß; sugar, ʒiij; mixture of acacia, f.℥iß.; cinnamon water, f.℥xviii. Mix.)

Pulvis Cretæ Compositus *Lond.* Compound Chalk Powder. (Prepared chalk ℔ß; cinnamon ℥iv; tormentil, acacia, each, ʒiij; long pepper ℥ß. Reduce them separately into very fine powder, then mix.)

Pulvis Cretæ Compositus cum Opio *Lond.* Compound Powder of Chalk with Opium. (Compound chalk powder ℥vjß; powdered opium ℈iv. Mix.) One grain of opium is contained in about two scruples of this powder.

Chalk is contained also in hydrargyrum cum cretâ, and ung. plumbi comp.

Therapeutics. Chalk acts as an antacid and astringent on the intestinal canal; a little becomes absorbed and produces the remote effects of lime-water. It is used chiefly in diarrhœa, alone or combined with other astringents and aromatics.

Dose. Of mist. cretæ, f.℥j to f.℥ij; of pulv. cretæ comp. ʒß to ʒj; of confectio aromatica ʒj to ʒij. Of the chalk powder with opium the dose depends on the amount of opium desirable to administer.

Adulteration. The same as calx, detected by the above tests.

Calcii Chloridum *Lond.* Chloride of Calcium; Muriate of Lime.

Prep. By dissolving white marble or chalk in hydrochloric acid, evaporating to dryness, and afterwards fusing the salt and preserving it in well-closed bottles.

Prop. & Comp. White crystalline semitransparent masses or fragments, having a bitter, acrid, saline taste, deliquescent, very soluble in water, from which it can be crystallised; insoluble in alcohol. Composition of the fused salt (Ca Cl); of the crystallised (Ca Cl + 6HO).

Use. It is introduced into the London Pharmacopœia on account of the power possessed by the fused salt of abstracting water, and is employed in the preparation of chloroform; it can be used also in the rectification of spirits. As a medicine, chloride of calcium acts upon the glandular system; was formerly used in scrofula, but is now discarded.

Calx Chlorinata *Lond.* Chlorinated Lime.

Prep. By passing chlorine gas over hydrate of lime loosely spread out in a proper chamber or vessel until it is completely saturated.

Prop. & Comp. A whitish powder, having the odour of chlorine and an acrid taste; absorbs carbonic acid and water when exposed to the air, and at the same time gives off chlorine; is only partly soluble in water, the solution being alkaline, and possessing bleaching properties; the addition of an acid causes the rapid and copious evolution of chlorine. Composition, probably (Ca O, Cl O) or a hypochlorite of lime; but besides this compound, free lime, chloride of calcium, &c. are present.

Use. In the preparation of chloroform; also as a disinfectant agent to evolve chlorine: is not often given internally, or used externally, chlorinated soda being substituted for it.

CORNU USTUM, which consists chiefly of phosphate of lime, will be described in the animal Materia Medica.

CUPRUM. COPPER.

(Cu. Eq.=32.)

Cuprum *Lond. Appendix.* Copper, in the form of strips of the bright metal.

Prop. & Use. Metallic copper has a well-known peculiar red colour; sp. gr. 8·86; malleable and ductile; oxidisable in

air, especially when in contact with acids, alkalies, or fatty bodies: introduced as a test for the detection of silver; for when put into a solution of a salt of silver, the latter metal becomes deposited upon it as a white powder. Mercury would also be precipitated, but may be distinguished by running into globules when rubbed.

Cupri Sulphas venalis *Lond.* Impure or Commercial Sulphate of Copper, in crystals.

Cupri Sulphas *Lond.* Sulphate of Copper (purified).

Prep. The native sulphuret of copper, called copper pyrites, when roasted with free access of air, oxidates, and forms the sulphate; this salt however is very impure, containing, as the ore does, much iron, which, to a great extent, is removed by the process given in the London Pharmacopœia for its purification. (Commercial sulphate of copper, ℔. iv; boiling distilled water, Oiv. Pour the water on the sulphate, and apply heat, constantly stirring until it be melted; filter the solution while hot, and place it aside that crystals may form. Pour off the liquid and evaporate, that crystals may again form; then dry them all.)

Prop. & Comp. Oblique rhombic azure-blue crystals, with a styptic metallic taste; efflorescing slightly in dry air; soluble in water; precipitated by ammonia, but re-dissolved in excess of the re-agent. Composition ($CuO, SO_3 + 5HO$).

Therapeutics. Internally, in small doses, it is astringent to the alimentary canal; after absorption, a tonic to the nervous system. In large doses, a quick and powerful emetic. Externally in powder, or any strong solution, it acts as an escharotic; in a more diluted form, as a stimulant and astringent. It is given as an astringent in cases of obstinate diarrhœa and dysentery, also as a tonic in chorea and epilepsy; in some cases of narcotic poisoning, as an emetic. Externally it may be used in excessive granulations or ulcers, or to diminish excessive secretions from mucous membranes, as in ophthalmia, gleet, &c.

Dose. As an astringent or tonic, gr. ¼ to grs. ij; as an emetic, gr. v to gr. viij. Externally, in substance or in solution, from gr. j to gr. x, or more, to the f. ℥j.

Adulteration. Sulphate of iron in the commercial salts; sometimes sulphate of zinc is fraudulently added: the iron is detected by ammonia, not redissolving the oxide; zinc, by first precipitating the copper with sulphuretted hydrogen, then, on the addition of ammonia, some of the above gas being in solution, a whitish sulphuret of this metal is thrown down.

Cupri Ammonio-Sulphas *Lond.* Ammonio-Sulphate of Copper.

Prep. LOND. (Sulphate of copper, ℥j; sesquicarbonate of ammonia, ℥jß. Rub them together until carbonic acid ceases to escape, then dry the ammonio-sulphate of copper in the air, wrapped in bibulous paper.) During this process effervescence takes place from the evolution of carbonic acid gas from the ammoniacal salt, and it becomes moist from the copper salt losing most of its water of crystallisation.

Prop. & Comp. In powder, or small four-sided prisms, of an azure-blue colour, an ammoniacal odour and styptic metallic taste; soluble in water, the solution alkaline, and gives a green precipitate with arsenious acid; when heated, sesquicarbonate and then sulphate of ammonia are given off. Composition of the salt ($Cu\ O, SO_3 + HO + 2NH_3$); it contains, however, some free sesquicarbonate of ammonia, which preserves it from decomposition.

Off. Prep. LIQUOR CUPRI AMMONIO-SULPHATIS, LOND. Solution of Ammonio-Sulphate of Copper. (Ammonio-sulphate of copper, ℨj; distilled water, Oj. Dissolve and strain.)

Therapeutics. Given as a nervine tonic in the same cases as the sulphate of copper, but not as an emetic or astringent; sometimes externally, as a stimulant in eye affections.

Dose. Gr. $\frac{1}{4}$ to gr. ij. The solution is applied externally, and used for a test for arsenious acid.

Adulteration. It may contain some subsulphate and oxide of copper from decomposition; and the solution is apt to let these fall, unless excess of sesquicarbonate of ammonia is present in the salt.

Ærugo *Lond.* Diacetate of Copper; Verdigris.

Prep. By exposing copper-plates to the action of the fermenting marc of grapes, or pyroligneous acid, when this salt forms on the surface.

Prop. & Comp. In powder or masses consisting of very minute crystals, of a bluish-green colour, with a peculiar sour metallic odour, and styptic metallic taste; resolved by water into a soluble acetate and insoluble tris-acetate; when treated with sulphuric acid, it gives off acetic acid fumes; dissolves in this acid when dilute, and from the solution ammonia precipitates the oxide, but re-dissolves it when in excess. Composition ($2CuO, \bar{A} + 6HO$).

Off. Prep. LINIMENTUM ÆRUGINIS, LOND. Liniment of Ver-

digris. (Powdered verdigris, ℥j; vinegar, f.℥vij; honey, ℥xiv. Dissolve the verdigris in the vinegar, and strain through a linen cloth; then, the honey being added, boil down to a proper consistence.)

Therapeutics. Verdigris is used externally as an escharotic, in powder, or as Linimentum Æruginis, applied with a camel's-hair pencil.

Adulteration. It sometimes contains chalk and sulphate of copper, detected by effervescence with an acid, and the solution precipitating with ammonia and chloride of barium. Other impurities can be detected by the tests given above.

FERRUM. IRON.

(FE. EQ.=28.)

Ferrum in fila tractum *Lond.* Iron wire.

Iron in the metallic state is not ordered as a medicine by the London College, but only to be used in the formation of the iodide, the purified sulphate, and iron wine; and when thus employed, should be soft or wrought iron, which is flexible and non-resilient.

Ferri Pulvis *Dub.* Fer reduit. Metallic Iron in powder, or reduced iron.

Prep. Ordered to be made in the Dublin Pharmacopœia by introducing the oxide of iron into a gun-barrel, and then reducing it to the metallic state, by heating it in a furnace, and passing through it hydrogen gas.

Prop. & Comp. An impalpable powder, of a steel-grey colour, soluble in dilute hydrochloric and sulphuric acids, with effervescence from the evolution of hydrogen; oxidises when exposed to damp air: it should be pure iron, but there is usually a little carbon, and some sulphuret of iron.

Therapeutics. Of Pulvis Ferri and of Iron Salts in general. Iron forms an essential part of the red corpuscles of the blood; this portion of the blood, from various causes, is apt to become deficient, and a state of system is then induced, known by the name of anæmia: to restore the blood when in such a condition to the healthy standard, no other medicines but the iron preparations are known, and hence these salts form a most valuable portion of our Materia Medica. Metallic iron, especially in the form of pulvis ferri, or reduced iron, possesses this power in a high degree; it is readily soluble in

the stomach, and the only objection to its use is, that occasionally it produces eructations of hydrogen from that organ, and if it contains sulphuret of iron, sulphuretted hydrogen may be evolved. Iron preparations are apt to produce astringent effects, some more than others; the persalts more than the protosalts, and hence the advantage of the use of mild purgatives during their administration. Besides their action on the blood, iron preparations produce some decided effects upon the nervous system, and are useful when symptoms referable to debility of that system are present. Iron in some of its forms is given in anæmia from any cause, in amenorrhœa connected with an anæmic state, in neuralgia, chorea, and epilepsy; also in some forms of passive hæmorrhages. The peculiar power of the different preparations are given under the head of each.

Dose. Of fer reduit, or iron in powder, gr. iij to gr. vj. All iron preparations may be given with advantage upon a meal.

Adulteration. Reduced iron is very apt to contain some sulphuret, from a subsulphate being thrown down with the oxide. Occasionally magnetic oxide has been mixed or substituted for the reduced metal; the former can be detected by the evolution of sulphuretted hydrogen when an acid is added; the latter by the want of effervescence or non-evolution of hydrogen.

Ferri Carbonas. Carbonate of Iron.

This carbonate is not contained in the Pharmacopœias, in its simple state, on account of the liability to change, but there are three officinal preparations, whose value depend upon it.

Prep. Made by decomposing any of the protosalts, as the sulphate of iron, by means of an alkaline carbonate.

Prop. & Comp. A light green-coloured powder; when dried in air, it becomes much darker, and lastly red, from more or less conversion into the sequioxide and loss of carbonic acid. This change is prevented to a considerable extent by sugar and treacle.

Off. Prep. FERRI COMPOSITA CUM SACCHARO, LOND. Saccharine Carbonate of Iron. (Sulphate of iron ℥iv; carbonate of soda ℥iv, ʒij; sugar ℥ij; boiling distilled water Oiv. Dissolve the carbonate and sulphate separately in Oij of water. Mix the solutions together while hot, and set aside, that the carbonate of iron may subside; then, the supernatant liquid being poured off, wash the precipitated carbonate frequently with water. To this add the sugar, dissolved in f.ʒij of water, and evaporate

the mixture in a water-bath until the powder is dried. Keep it in a well-closed vessel.)

MISTURA FERRI COMPOSITA, LOND. Compound Mixture of Iron. (Powdered myrrh ʒij; carbonate of potash ʒj; rose-water, f. ℥xviij; powdered sulphate of iron ℈ijß; spirit of nutmeg, f. ℥j; sugar ʒij. Rub the myrrh with the spirit of nutmeg and the carbonate of potash: to these, while rubbing, add first the rose-water, with the sugar, then the sulphate. Put the mixture immediately into a glass vessel, and stop it.)

PILULA FERRI COMPOSITA, LOND. Compound Pill of Iron. (Powdered myrrh ʒij; carbonate of soda, sulphate of iron, treacle, each ʒj. Rub the myrrh with the carbonate, first warming the vessel; then the sulphate being added, rub them again; lastly, beat all together, that a mass may be formed.)

Therapeutics. The carbonate of iron in any of the above preparations has all the properties of iron noticed before under Pulvis Ferri. The carbonate is not astringent, and produces little or no action upon the mucous membranes of the alimentary canal. It has enjoyed great repute in the form of mist. ferri comp., or Griffiths's mixture, as it was called, in the treatment of anæmic amenorrhœa; the compound pill, when freshly made, is also a good preparation, and likewise the newly-introduced ferri carbonas cum saccharo.

Dose. Of ferri carbonas cum saccharo, gr. v to ℈j or more; of mist. ferri comp., f.℥j to f.℥ij; of pil. ferri comp., gr. v to ℈j or more. When the mixture has been kept many days, it becomes reddish-brown in colour, from the green carbonate being converted into the sesquioxide of iron.

Ferri Iodidum *Edin. Dub.* is not now contained in the London Pharmacopœia, except as the syrup: the principle of its formation is the same as that of the London syrup.

Prop. & Comp. When in a dry state it is crystalline, of a greyish-black metallic appearance; when heated, gives off violet vapours; very deliquescent; forms at first a greenish solution in water, which rapidly decomposes into free iodine and sequioxide of iron: if an iron wire is kept in the solution, the strength remains the same, for, as the iodine becomes free, it dissolves the metallic iron and again forms the iodide. A strong syrup prevents the change. Composition, when fused (Fe I), or a protiodide.

Off. Prep. SYRUPUS FERRI IODIDI, LOND. Syrup of Iodide of Iron. (Iodine ℥j; iron, drawn into wire, ʒiij; distilled water, f.℥xij, or as much as may be necessary; sugar ℥x. Mix

the iodine and iron with f.℥viij of water, and heat until the solution assumes a greenish colour; then strain. Evaporate the solution to about f.℥iv, and add the sugar. Lastly, when the syrup has cooled, add as much water as may be necessary to fill a measure of ℥xv, and keep it in a well-stoppered black glass vessel.)

Therapeutics. Iodide of iron possesses the valuable effects of the ferruginous salts, in addition to those of iodine; it is peculiarly applicable to the treatment of scrofulous diseases in cachectic subjects requiring iron; it should be remembered that the proportion of iron to iodide is small, only as 1 to 4½.

Dose. Of the syrup (containing about 5 grs. of iodide of iron to f.ʒj) ♏xx to f.ʒj. Of the iodide itself, gr. ij to gr. v, or more.

Ferri Sulphas venalis *Lond.* Impure Sulphate of Iron, crystallised; the commercial salt is ordered to be purified, as it is apt to contain much impurity, and it then forms the following.

Ferri Sulphas *Lond.* Sulphate of Iron (purified).

Prep. Lond. (Commercial sulphate of iron, ℔. iv.; sulphuric acid, f. ℥j; iron, drawn into wire, ℥j; distilled water Oiv. Mix the acid with the water, and add the sulphate and the iron; then apply heat, frequently stirring until the sulphate is dissolved. Strain the solution while hot, and put by, that crystals may form. Evaporate the liquor poured off, that crystals may again form. Dry all these.) By dissolving the impure sulphate, which contains sesquisulphate, traces of copper, &c. in water acidulated with sulphuric acid, and then putting in iron wire, an evolution of hydrogen is produced, which reduces any persalt to the condition of a proto-salt, and also causes the precipitation of copper, if that metal be present, upon the excess of iron wire which is ordered.

Prop. & Comp. Pure sulphate of iron crystallises in light bluish-green rhomboidal prisms, having an astringent styptic taste; composition ($Fe\,O, SO_3 + 7\,HO$); it dissolves in about 1½ times its weight of cold water; is insoluble in alcohol; it generally contains a little persalt; the solution, when exposed, rapidly oxidates.

Off. Prep. It is used in the preparation of mist. ferri comp. and pil. ferri comp.; but in both these compounds the carbonate of iron is formed from the sulphate. In the Edinburgh and Dublin Pharmacopœias there is a *dried sulphate of iron* introduced, useful for giving the salt in the form of pills.

Therapeutics. The same as iron salts in general, but in

addition it has a powerful astringent action, and is apt in large doses to irritate the stomach. It may be employed when an astringent is required with iron, as in passive hæmorrhages and mucous discharges. It may also be used externally for its constricting powers.

Dose. Gr. j to gr. v, in pill or solution recently prepared.

Incompatibles. None of the soluble iron preparations should be given with vegetable infusions or tinctures containing tannin or gallic acids, as an inky compound is formed, which, though efficient as a medicine, is not agreeable to the patient.

Ferri Sesquioxidum *Lond.* Sesquioxide of Iron.

Prep. Lond. (Sulphate of iron ℔s. iv; carbonate of soda ℔s. iv. ℥ij; boiling water, six gallons. Dissolve the sulphate and carbonate separately in three gallons of water; mix the liquors together while hot, and set aside, that the precipitate may subside. Pour off the supernatant fluid, wash the precipitate frequently, and dry it.) In this process the carbonate of iron which is at first thrown down becomes converted, during the washing and drying, chiefly into the sesquioxide, by absorbing oxygen and losing carbonic acid.

Prop. & Comp. A reddish powder, of a slight styptic taste, insoluble in water, but soluble in dilute hydrochloric acid; composition ($Fe_2 O_3$); but it generally contains a little carbonate of iron, and hence effervesces during solution in the acid: from the solution the red oxide is thrown down by potash, and if pure the filtered fluid should then be free from colour, and not altered by sulphuretted hydrogen or ferrocyanide of potassium. It is often calcined to improve its colour, but this process injures it by diminishing the solubility.

Off. Prep. Emplastrum Ferri, *Lond.* Plaster of Iron. (Sesquioxide of iron ℥j; plaster of lead ℥viij; prepared frankincense ℥ij. Sprinkle the sesquioxide into the plaster and frankincense, melted together over a slow fire, and mix.)

Therapeutics. Use as given under *Pulvis Ferri*: it is a non-irritating preparation, and is useful when it is desirable to continue the use of iron for a long time or to give it in large doses; it has been much administered in tic douloureux and other neuralgic affections. As an external application its value is very questionable.

Dose. Gr. x to ʒj or more in treacle or honey.

The Sesquichloride of Iron is not used except as a tincture or in the form of a salt called the ammonio-chloride of iron.

Tinctura Ferri Sesquichloridi *Lond.* Tincture of Sesquichloride of Iron.

Prep. LOND. (Sesquioxide of iron ℥vj; hydrochloric acid Oj; rectified spirit Oiij. Mix the sesquioxide with the acid, and digest in a sand-bath, frequently shaking until it is dissolved; when cold, add the spirit, and drain.) In this process a sesquichloride is made directly from the oxide, and is contained as such in the tincture.

Prop. & Comp. A dark red liquid, having an ethereal odour and highly astringent, acid and styptic taste; sp. gr. 0·992. A fluid ounce should yield nearly 30 grains of sesquioxide of iron when precipitated with potash. The composition of the sesquichloride is ($Fe_2 Cl_3$); there is also formed some chloride of ethyl from the action of the excess of acid upon the spirit.

Therapeutics. A most powerful astringent ferruginous preparation, useful in passive hæmorrhages and other discharges, seldom given simply as a blood-restorer.

Dose. ♏x to f.ʒß. diluted freely.

Incompatibles. The same as of other soluble preparations of iron.

Ferri Ammonio-Chloridum *Lond.* Ammonio-Chloride of Iron.

Prep. LOND. (Sesquioxide of iron ℥iij; hydrochloric acid Oß.; hydrochlorate of ammonia, ℔ ijß; distilled water Oiij. Mix the sesquioxide with the acid, and digest it in a sand-bath, frequently stirring until it is dissolved; then add the hydrochlorate, first dissolved in the water; strain, and evaporate the liquor until the salt is dried. Rub this into powder.)

Prop. & Comp. It occurs in small orange pulverulent grains of hydrochlorate of ammonia stained with the sesquichloride of iron, and is not a true chemical compound; soluble in proof spirit and water, and 100 grains yield, when treated in solution with potash, about 7 grains of the sesquioxide of iron. It contains about 15 per cent. of the iron salt.

Off. Prep. TINCTURA FERRI AMMONIO-CHLORIDI, LOND. Tincture of Ammonio-Chloride of Iron. (Ammonio-chloride of iron ℥iv; proof spirit, distilled water, each, Oß. Dissolve and strain.) Mr Denham Smith says that the College authorises him to state that the above is correct; in the Pharmacopœia a pint of each liquid is ordered. An ounce of this tincture, on the addition of potash, should yield 5·8 grains of sesquioxide of iron.

Therapeutics. An astringent iron preparation, but three-

fourths of its weight is sal ammoniac; it might well be omitted from the Pharmacopœia.

Dose. Of the salt, gr. v to gr. xv; of the tincture, ♏x to f.ʒß.

Ferri Ammonio-Citras *Lond.* Ammonio-Citrate of Iron.

Prep. LOND. (Sulphate of iron ℥xij; carbonate of soda ℥xijß; citric acid ℥vj; solution of ammonia, f. ℥ixß; boiling distilled water Oxij. Dissolve the sulphate and carbonate separately in six pints of water. Mix the solutions, yet hot, and set by, that the precipitate may subside. The supernatant liquor being poured off, wash the precipitate frequently with water, add the acid, and dissolve by the aid of heat. Then, when it has cooled, add the ammonia and evaporate to the consistence of syrup. Dry this with a gentle heat, spread thinly on flat earthenware plates; and let it be kept in a well-closed vessel.) In this process a carbonate of iron is first formed; which, after washing and partial conversion into the sesquioxide, is dissolved in the citric acid, and the solution afterwards neutralised by ammonia.

Prop. & Comp. It is not crystalline, but dries in garnet-red transparent scales; soluble in water, and forming a neutral solution of a very slight styptic taste; not precipitated by ferrocyanide of potassium, but the red oxide of iron is thrown down by caustic alkalies and lime; 100 grains of the salt should yield 34 grains of oxide. Its composition is not well known; it contains however *citrate of iron* and *ammonia.*

Therapeutics. As a blood-restorer it is a very effectual salt, and it possesses scarcely any astringency; it may often be given when the stomach will not bear the more styptic preparations of iron.

Incompatibles. Tannin solutions strike black; caustic alkalies precipitate the oxide.

Ferri Potassio-Tartras *Lond.* Potassio-Tartrate of Iron.

Prep. LOND. (Sulphate of iron ℥iv; sulphuric acid, f. ℥ß; nitric acid, f. ℥j; solution of ammonia, f ℥x; bitartrate of potash, powdered, ℥ij; distilled water, four gallons. Dissolve the sulphate in a pint of water with the sulphuric acid; then, heat being applied, gradually add the nitric acid. Boil down the solution to the consistence of a syrup, and mix with the remainder of the water: then add ammonia to precipitate the sesquioxide of iron: wash this, and set aside for 24 hours. Then heat the bitartrate mixed in half a pint of distilled water to 140° F., and to it add gradually the moist sesquioxide, the supernatant water being first poured off. Separate by means of a linen cloth the

portion of oxide not dissolved, then evaporate the clear liquor until the salt is dry. The potassio-tartrate of iron may, however, be dried in the same way as the ammonio-citrate of iron.) In this process the sulphate of iron is first made into a complete persalt by the nitric acid, and from this the sesquioxide is precipitated by ammonia, which, by boiling with bitartrate of potash, forms the double salt under consideration.

Prop. & Comp. As usually prepared, it forms garnet scales, having the physical characters of the ammonio-citrate; soluble in water, the solution is neutral, not precipitated by ferrocyanide, nor by an *alkali*, unless heat is applied, when from 100 grains about 34 grains of sesquioxide of iron may be obtained.

Therapeutics. Exactly the same action and uses as ammonio-citrate of iron; it can be prescribed with alkalies.

Dose. Gr. vj to ℈j.

Vinum Ferri *Lond.* Wine of Iron; Steel Wine.

Prep. Lond. (Iron wire ℥j; sherry wine Oj. Digest for 30 days and strain.)

Prop. & Comp. This preparation contains some potassio-tartrate of iron, formed by the action of the bitartrate of potash upon the metal: the quantity varies with the quality of the wine, and the more acid the wine, the greater the amount of iron dissolved; it usually contains about 16 grains of sesquioxide of iron to the pint. A good substitute can be made by dissolving the desired amount of potassio-tartrate of iron in wine.

Therapeutics. A mild chalybeate, useful in anæmic conditions of the system.

Dose. f.ʒj to f.℥ss.

HYDRARGYRUM. MERCURY.

(Hg. Eq.=100.)

Hydrargyrum (Colatum) *Lond.* Strained Mercury, or Quicksilver.

Prep. Mercury is obtained chiefly from its sulphuret, native cinnabar, by distillation with iron; sometimes it is met with in its metallic state, sometimes combined with chlorine, &c.

Prop. & Comp. When pure, mercury occurs as a brilliant white metallic liquid, becoming solid at—39° Fah.; sp. gr. 13·5; entirely vaporised by heat; and when small globules of it are rolled slowly upon a sheet of paper, not the least particle

adheres; above 40° Fah. a slight vapour arises from it. It forms two classes of salts, proto and per salts. It dissolves many metals, as tin, bismuth, zinc, silver, and gold, and forms amalgams with them.

Off. Prep. Liquid mercury is seldom used in medicine, but there are many preparations which owe their value to mercury in a very highly divided state, caused by long trituration with saccharine and greasy matters, or fine powders, as follows:

HYDRARGYRUM CUM CRETÂ, LOND. Mercury with Chalk. (Mercury ʒiij; prepared chalk ℥v. Rub together until globules are no longer visible.)

PILULA HYDRARGYRI, LOND. Mercurial Pill. (Mercury ℥ß; confection of roses ʒvj; powdered liquorice ʒij. Rub the mercury with the confection until globules can no longer be seen; then, the liquorice being added, beat the whole together to form a mass.)

EMPLASTRUM HYDRARGYRI, LOND. Mercurial Plaster. (Mercury ℥iij; plaster of lead ℔j; olive oil, f. ʒj; sulphur, gr. viij. Add the sulphur gradually to the heated oil, stirring constantly with a spatula until they unite; afterwards rub the mercury with them until globules are no longer visible; then gradually add the plaster of lead melted over a slow fire, and mix them all.)

EMPLASTRUM AMMONIACI CUM HYDRARGYRO, LOND. Plaster of Ammoniacum with Mercury. (Prepared ammoniacum, ℔j; mercury ℥iij; olive oil, f. ʒj; sulphur, gr. viij. Add the sulphur gradually to the heated oil, stirring constantly with a spatula until they unite; then rub the mercury with them until globules are no longer visible; lastly, gradually add the ammoniacum liquefied, and mix them all.)

UNGUENTUM HYDRARGYRI, LOND. Mercurial Ointment. (Mercury ℔j; lard ℥xiß; suet ℥iß. Rub the mercury with the suet and a little of the lard until globules are no longer visible, then add the remaining lard, and triturate all together.)

CERATUM HYDRARGYRI COMPOSITUM, LOND. Compound Cerate of Mercury. (Ointment of mercury, compound soap cerate, of each ℥vj; camphor ʒjß. Rub them together.)

LINIMENTUM HYDRARGYRI, LOND. Mercurial Liniment. (Ointment of mercury, lard, each ℥iv; camphor ʒj; rectified spirit, f. ʒj; solution of ammonia, f. ℥iv. Rub first the camphor with the spirit, then the lard and ointment; lastly, gradually add the ammonia: mix them all.)

Therapeutics. Liquid mercury, when taken into the stomach, appears to possess no action on the economy, and very large quantities, even pounds, have at times been swallowed without any particular symptoms being induced; now and then, how-

ever, the full effects of the metal have ensued, probably owing to partial oxidation and absorption. The vapour of this metal acts with great energy, as seen in the effects on artificers exposed to its influence; the same may be produced by rubbing mercury in a very highly divided state upon the surface of the body, or taking it internally in such a form. Given in small doses, the first effects of mercurials are observed in the increase of various secretions; and hence sialagogue, cholagogue, diuretic, emmenagogue, and other properties have been ascribed to this mineral. Its sialagogue power is shown in the increase of the salivary fluid, and mucous secretions of the mouth, together with a peculiar condition of the gums and neighbouring parts; and as these symptoms are amongst the first, most constant, and peculiar effects of mercurials, they are generally taken as guides in the administration of the drug, as to the propriety of increasing or diminishing the dose. The sialagogue effects are seldom desired for themselves. The cholagogue and purgative action of mercurials is exhibited in the increase of the colouring matter and other principles of the bile in the evacuations from the bowels, which are at the same time more liquid in character from an excessive secretion from various other secreting glands, as the pancreas, and mucous membrane of the intestinal canal. The secretions of the kidneys are not unfrequently augmented, also the action of the skin, and occasionally the catamenial discharge; it seems probable, however, that many of these latter effects are not so much due to the direct action of the remedy on the secreting organs, as to the relief of certain morbid conditions of the system, giving rise to imperfect performance of these functions. Mercurials cause also the absorption of morbid fluids, either from increasing the activity of the absorbent system, or preventing deposition. In whatever way mercury is administered it becomes absorbed into the blood, where it has been detected; and its presence has also been demonstrated in the milk, urine, saliva, sweat, bile, pus from ulcers; and in the various tissues of the body, as the bones, brain, serous and synovial membranes, cellular tissue, and lungs. Its action on the blood is not well made out; it diminishes the amount of globules, and has some influence on the quantity and quality of the fibrine. Mercurials are employed in the treatment of various diseases, among which the following are the most important.

In *internal congestions*, as of the liver, kidneys, &c.; to increase secretions, and hence relieve the vessels of the parts.

Acute inflammation of any part is often found to give way when the system is brought under the influence of mercury,

probably from its powers of increasing the secretions of the part, influencing the capillary circulation, and altering the condition of the blood; sthenic inflammations, with effusions of plastic lymph, are more controlled by the drug than those of an asthenic kind; serous membranes are more influenced than mucous membranes, and the parenchyma of the liver more than that of the lungs. In *chronic inflammations* mercurials often prove useful in removing the morbid products, such as induration, and fibrinous and other effusions.

Mercury is injurious in erythematous and scrofulous inflammations, and also in any of a low type.

In acute *rheumatism* mercurials are much employed by some practitioners; it is questionable whether they influence the duration of the disease, but are useful in the peri- or endocarditis, which is so frequently present.

In *dropsies* dependent on inflammation of serous membranes and hepatic disease mercurials are useful, but generally injurious when arising from granular disease of the kidneys.

In idiopathic *fevers* mercurials are often useful in keeping up the action of secreting organs and relieving congestions, but they appear to have no influence on the duration of the fever itself.

In *syphilis*, mercurials at one time formed the sole remedy; at the present time they are not considered essential to the cure of the affection, although employed in moderate quantities, both for the primary and secondary forms of the disease: it is probable that the terrible sequences of syphilis, formerly so commonly met with, were often as much dependent on the drug as on the disease itself.

Mercury is very commonly used as an alterative in chronic affections of almost every part of the system, and as a cholagogue purgative in cases of dyspepsia, &c., where the secretion of the liver is defective.

Externally employed, in the form of ointment, &c., mercurials produce a topical stimulant action, causing exalted action of the capillaries of the part; they also become absorbed, and affect the system generally. They are used over indurated and chronically inflamed parts, and sometimes to introduce the mineral into the system.

Effects of over-doses, or the too great action of Mercurials.

Very profuse ptyalism, swelling of the tongue and salivary glands, and the whole face, tumefaction and redness of the gums, ulceration of different parts of the mucous membrane of the mouth, loosening of the teeth, and even necrosis of the jaw.

Occasionally the flow of saliva and buccal mucus amounts to some pints in the day.

Excessive purging, with very bilious stools.

Certain skin affections, as Eczema Mercuriale.

Inflammation of the periosteum and bone, of parts not connected with the mouth.

A low, febrile condition (mercurial erythism), accompanied with intense prostration of the vital powers.

Affections of the nervous system, such as neuralgic pains, partial paralysis (tremor mercurialis), and sometimes complete paralysis, and death; usually observed in those subject to the action of the mercurial vapours.

Circumstances influencing the operation of Mercurials.

The age of the patient has great influence; children are much less affected than adults; still care should be used in administering mercurials to young subjects, as very injurious results sometimes ensue.

Certain individuals appear to be able to resist completely the action of mercurials, others to be very susceptible to their influence; often such idiosyncrasies cannot be explained, but at times they depend on a diseased condition of the system.

The presence of acute sthenic inflammation gives a resisting power to the action of mercurial preparations, whereas granular disease of the kidney, scrofula, and scorbutus, render the system susceptible to mercury, and the drug should generally be avoided in such cases.

Dose. Of hydrargyrum cum cretâ, gr. v to gr. xv; of pilula hydrargyri, gr. iij to gr. x.

The unguentum hydrargyri may be rubbed into a part where the skin is thin, as in the arm-pit or inner side of the thigh, in quantities varying from ʒß. to ʒij. The inunction should be continued till absorption has taken place.

Adulteration. Other metals, as lead, tin, zinc, and bismuth, in a state of amalgamation with mercury, or dissolved in it: when such are present, the small globules leave a trail when rolled along a sheet of paper: zinc and tin are soluble in hydrochloric acid, and lead and bismuth would not volatilise, and so could be detected.

Hydrargyri Chloridum *Lond.* Chloride of Mercury, Calomel.

Prep. LOND. (Mercury ℔s. iv; sulphuric acid, f. ℥xxj ß; chloride of sodium ℔. jß. Boil ℔s. ij of mercury with the acid until dry bipersulphate of mercury remains; rub this, when it

has cooled, with lbs. ij of mercury in an earthenware mortar, that they may be very well mixed; then add the chloride, and triturate them together until the globules are no longer visible; then sublime. Reduce the sublimate into the finest powder; wash it thoroughly with boiling distilled water, and dry it.) In this process the bipersulphate of mercury first formed, as explained under the Bichloride, is afterwards, by being rubbed with a second equivalent of the metal, reduced to a condition capable of forming, when heated, the neutral sulphate; and this by the action of the common salt is converted into the chloride of mercury, sulphate of soda being produced at the same time.

Prop. & Comp. Calomel, when sublimed, occurs in cakes, with a crystalline structure; but as a drug it is met with in the form of a white, or yellowish white, heavy powder, without odour or taste; sublimes with heat; treated with potash it is blackened, and when afterwards heated runs into metallic globules, from the reduction of the oxide first formed. When boiled or washed in water, this fluid should afterwards give no precipitate with nitrate of silver, lime-water, or sulphuretted hydrogen. By the action of nitric and hydrochloric acids, it is converted slowly into the bichloride.

Off. Prep. PILULA HYDRARGYRI CHLORIDI COMPOSITA, LOND. Compound Pill of Chloride of Mercury. (Chloride of mercury, oxysulphuret of antimony, each ʒij; guaiacum powdered, treacle, each ℥ß. Rub the chloride with the oxysulphuret, then with the guaiacum and treacle, and form a mass.)

Therapeutics. Calomel when absorbed acts on the system in the manner noticed under Hydrargyrum. Its peculiarities are, that it produces little local irritant action; is a purgative, increasing the secretion of bile and other intestinal fluids: hence forms a useful adjunct in affections of the liver, and obstructions to the portal circulation. It often produces in children the so-named Calomel stools, or green-coloured fæces. The compound pill is employed chiefly as an alterative in chronic skin diseases, in which the antimony and guaiacum aid its operation.

Dose. As a purgative, gr. ij to gr. vj; to affect the system, gr. ½ to gr. j or more, frequently repeated. Of pil. hydrargyri chloridi comp., as an alterative, gr. v to gr. x.

Adulteration. Calomel is apt to contain a trace of the bichloride of mercury formed in the process of preparation: this can be detected by the water in which it is boiled, exhibiting reactions with the tests above given. Intentional impurities, as carbonate of lead, sulphate or carbonate of baryta, &c., are not volatilised by heat, and the carbonates effervesce with acids.

Hydrargyri Bichloridum *Lond.* Bichloride of Mercury; Corrosive Sublimate.

Prep. LOND. (Mercury ℔s. ij; sulphuric acid, f.℥xxj ß; chloride of sodium ℔. j ß. Boil the mercury with the acid until dry bipersulphate of mercury remains. Rub this, when it has cooled, with the chloride in an earthenware mortar; then, the heat being gradually increased, sublime.) By the action of boiling sulphuric acid on mercury, a salt, called the bipersulphate ($Hg\,O_2$, $2\,S\,O_3$), is first formed; (regarding the equivalent of mercury as one-half the one taken above, it would be a neutral sulphate;) when this is heated with the common salt, mutual exchange takes place; and bichloride of mercury, and sulphate of soda, are produced, as represented in the formula $Hg\,O_2, 2.\,S\,O_3+2.\,Na\,Cl=Hg\,Cl_2+2.\,Na\,O, S\,O_3$.

Prop. & Comp. Corrosive sublimate occurs in heavy white crystalline masses of a styptic and metallic taste. Composition ($Hg\,Cl_2$); soluble in about 20 parts of cold water; much more so in alcohol; soluble also in ether: melts and entirely sublimes when heated. Its watery solution is precipitated by alkalies and lime-water red or yellowish (the binoxide); when this precipitate is heated, it gives off oxygen, and runs into globules of metallic mercury: the solution of corrosive sublimate precipitates albumen, and forms with it a definite insoluble compound.

Off. Prep. LIQUOR HYDRARGYRI BICHLORIDI, LOND. Solution of Bichloride of Mercury. (Bichloride of mercury, hydrochlorate of ammonia, each grs. x; distilled water Oj. Dissolve.) The hydrochlorate of ammonia increases the solvent power of water upon corrosive sublimate.

Therapeutics. A very powerful irritant; when taken in large doses, it causes burning at epigastrium, vomiting and purging; applied to the skin, it acts as a corrosive. In very small doses it is useful as an alterative in chronic affections, syphilitic or not, as in scaly skin diseases, periosteal affections, &c.; externally, as a lotion, injection, gargle, or ointment, in chronic skin diseases, ulcerated sore throats, and chronic discharge from mucous membranes. All the ordinary effects of mercury may be produced by this salt.

Dose. Gr. $\frac{1}{20}$ to gr. $\frac{1}{4}$, in solution or pill, with crumb of bread. Of liq. hydrargyri bichloridi, *Lond.*, ♏xl to f.ʒij.

Incompatibles. In solution it precipitates most of the vegetable preparations which contain albumen, tannin, &c. It is also thrown down by alkalies, alkaline sulphurets, iodides, and

tartar emetic. With the iodide in excess it is converted into biniodide, and redissolved as such.

Hydrargyri Ammonio-Chloridum *Lond.* Ammonio-Chloride of Mercury; White Precipitate of Mercury.

Prep. LOND. (Bichloride of mercury ℥vj; distilled water Ovj; solution of ammonia f.℥viij. Dissolve the bichloride in the water, aided by heat; to this, when it has cooled, add the ammonia, frequently shaking it. Wash the precipitated powder until it be free from taste; lastly, dry it.) When ammonia is added to a solution of corrosive sublimate, a peculiar compound, and not the oxide of mercury, is precipitated.

Prop. & Comp. A white, amorphous, heavy powder, usually in the form of small spiral cones from the wringing of the linen filters; sublimes when heated; insoluble in water, dissolves in hydrochloric acid without effervescence; and when heated with potash gives off vapours of ammonia, and becomes yellow from the formation of the binoxide of mercury: generally considered as a double bichloride and binamide of mercury ($HgCl_2 + Hg(NH_2)_2$). Some doubts exist as to its true nature.

Off. Prep. UNGUENTUM HYDRARGYRI AMMONIO-CHLORIDUM, LOND. Ointment of Ammonio-Chloride of Mercury. (Ammonio-chloride of mercury ʒij; lard ℥iij. Add the ammonio-chloride to the lard, and rub them well together.)

Therapeutics. Never used internally; externally, it destroys pediculi, and acts as a stimulant application when used to chronic skin affections in the form of the ointment.

Adulteration. Chalk, carbonate of lead, plaster of Paris, &c.; these do not sublime when heated: the carbonates effervesce with acids.

Hydrargyri Iodidum *Lond.* Iodide of Mercury.

Prep. LOND. (Mercury ℥j; iodine ʒv; rectified spirit, as much as may be necessary. Rub the mercury and iodine together, gradually adding the spirit, until the globules are no longer visible. Dry the powder with a gentle heat as quickly as possible, access of light being prevented, and keep it in a black glass vessel well stoppered.) Direct union takes place when mercury and iodine are brought into contact with each other in a highly-divided state, the spirit aids the union by its solvent power upon the iodine.

Prop. & Comp. When thus prepared it forms a dingy greenish-yellow powder, subliming, when carefully heated, in

red crystals, which soon become yellow, and, if exposed to light, black; it is insoluble in water, and also in a solution of chloride of sodium; it is apt to decompose with the formation of some biniodide of mercury. Composition (Hg I).

Off. Prep. Unguentum Hydrargyri Iodidi, Lond. Ointment of Iodide of Mercury. (Iodide of mercury ʒj; white wax ℥ij; lard ℥vj. To the wax and lard melted together add the iodide, and rub well together.)

Therapeutics. Acts similar to calomel, not a very irritating preparation, perhaps is less purgative, more readily affecting the system; it has been proposed in venereal diseases occurring in scrofulous habits. Externally it is alterative, and useful in chronic skin diseases.

Dose. Gr. j to gr. iij.

Adulteration. It may contain a little biniodide of mercury, which is a powerful irritant; this is detected by being soluble in a solution of common salt, also in spirit.

The *biniodide of mercury* was formerly officinal in the London Pharmacopœia, is still in the Edinburgh; has the irritant properties of the bichloride, and must be given in similar doses.

Nitrate of Mercury is made officinal only in the form of the

Unguentum Hydrargyri Nitratis *Lond.* Ointment of Nitrate of Mercury.

Prep. Lond. (Mercury ℥ij: nitric acid, f. ℥iv; lard ℔j; olive oil, f. ℥viij. Dissolve the mercury in the acid; then mix the liquor, while hot, with the lard and oil melted together.) In this process part of the nitric acid is decomposed, and oxidises the mercury, which then forms the salt with another portion.

Prop. & Comp. The composition of the mercurial salt is represented by the formula ($Hg\,O_2$, $2\,NO_5$); this, when mixed with the fatty matters, reacts on the olein, and produces another body, elaïdine. When fresh, the ointment is citron-yellow, hence it has been called Citrine or Golden Ointment: it is apt to become greyish, hard, and brittle by age, from partial reduction of the mercurial salt; this is prevented by using a little more acid and a higher temperature in preparing it.

Off. Prep. Unguentum Hydrargyri Nitratis Mitius, Lond. Milder Ointment of Nitrate of Mercury. (Ointment of nitrate of mercury ʒj; lard ʒvij. Rub them together. This ointment is to be used recently prepared.)

Therapeutics. These ointments act as stimulants, and are used in skin affections, ulcers, and especially in chronic inflam-

matory diseases of the eyes, as in ophthalmia tarsi, &c. The strong ointment can be diluted in any degree requisite.

Hydrargyri Nitrico-oxidum *Lond.* Nitric Oxide of Mercury.

Prep. LOND. (Mercury ℔.iij; nitric acid, f. ℥xviij; distilled water Oij. Mix, and apply a gentle heat until the mercury is dissolved. Boil down the liquor, and rub what remains to powder. Put this into a very shallow vessel, then apply a slow fire, and gradually increase it until red vapour ceases to arise.)

Prop. & Comp. Red shining crystalline scales, subliming, when strongly heated, without the production of red fumes; insoluble in water, but soluble in nitric and hydrochloric acids. Composition ($Hg\,O_2$).

Off. Prep. UNGUENTUM HYDRARGYRI NITRICO-OXIDI, LOND. Ointment of Nitric Oxide of Mercury. (Nitric oxide of mercury ℥j; white wax ℥ij; lard ℥vj. To the wax and lard melted together, add the nitric oxide reduced into very fine powder, and rub them together.)

Therapeutics. Used only externally as a powerful irritant and escharotic; applied as an ointment to the eye in ophthalmia, to indolent ulcers, &c.; as an escharotic, in powder, alone or mixed with sugar, to specks in the cornea, over excrescences, chancres, and fungous ulcers.

Adulteration. Brick-dust, red-lead, and other red powders, detected by not being volatile; some undecomposed nitrate of mercury may be present, and then red fumes are given off when heated; the nitrate is also soluble in water.

Hydrargyri Bisulphuretum *Lond.* Bisulphuret of Mercury; Artificial Cinnabar.

Prep. LOND. (Mercury ℔s. ij; sulphur ℥v. Mix the mercury with the sulphur melted over a fire, and as soon as the mass swells remove the vessel and strongly cover it lest the mixture take fire; then rub the mass to powder and sublime it.) When melted sulphur is brought in contact with mercury, direct union ensues, and the compound is afterwards sublimed.

Prop. & Comp. Dark scarlet shining crystalline masses, forming, when powdered, a beautiful scarlet colour, known by the name of vermillion; insoluble in water or alcohol. Volatilises entirely when heated alone, but with potash it is reduced to metallic globules. Composition ($Hg\,S_2$).

Therapeutics. When the fumes are brought into contact with the surface of the body, the drug acts as a topical alterative and

becomes absorbed, affecting the system the same as other mercurials; probably, when heated in the air, it is decomposed, at least in part. It is used as a fumigation in some syphilitic skin diseases, as ecthyma; also as an inhalation in venereal sore throat. Rarely or never used internally.

Dose. As a fumigating agent, ʒß, heated on an iron plate and placed under the patient wrapped in a blanket; or the vapours may be applied to the mouth and throat through a funnel.

Adulteration. Red-lead, red oxide of iron, and brick-dust, detected by not subliming; occasionally red sulphuret of arsenic has been found, but this can be detected by heating with charcoal, when it gives off the garlic odour; also by the other tests for arsenic.

Potassii et Hydrargyri Iodo-cyanidum *Lond. Appendix.* Iodo-cyanide of Potassium and Mercury.

Prep. When concentrated solutions of bichloride of mercury and iodide of potassium are mixed, this salt is precipitated.

Prop., Comp., & Use. Pearly white scales, little soluble in water, reddened by any acid except hydrocyanic. Composition ($Hg\,Cy_2 + K\,I$). Used as a test for the presence of a foreign acid in prussic acid: the reddening is due to the decomposition of the double salt, and the formation of red biniodide of mercury.

MAGNESIUM.

(Mg. Eq.=12.)

Magnesium, the metallic base of magnesian salts, does not exist native; when obtained artificially, is a brilliant grey-coloured metal; sp. gr. 2·2; not readily oxidated except when heated in air, and it then forms the earth magnesia.

Magnesia *Lond.* Magnesia; Protoxide of Magnesium.

Prep. Lond. (Carbonate of magnesia ℔j. Burn it for two hours in a very strong fire.) In this process the carbonate is converted into the oxide by the heat driving off the carbonic acid.

Prop. & Comp. A white powder with scarcely any taste; almost insoluble in water, but when moistened gives a slight alkaline reaction to turmeric paper, turning it brown. It dissolves in hydrochloric acid without effervescence; and from the solution nothing is precipitated by either bicarbonate of potash or chloride of barium, these tests showing the absence

of any carbonate, or lime, or sulphate. Magnesian salts are precipitated from a neutral solution by phosphate of soda and ammonia as an insoluble, ammonio-magnesian phosphate, a salt often deposited in neutral or alkaline urine. Composition (Mg O).

Therapeutics. In small doses, magnesia acts first as an antacid upon the alimentary canal; then becomes absorbed, and renders the urine alkaline; the salts formed by the presence of any acid in the stomach, have a purgative tendency: in large doses it produces distinct purgative effects. It is used in acidity of stomach and heartburn, and in affections connected with an increased excretion of uric acid, or urates; also as a purgative in acid conditions of the alimentary canal, especially in children. It should be given cautiously, as it is rather apt to form concretions in the intestines when taken for a lengthened period.

Dose. As an antacid, gr. x to ℈j; as a purgative or adjunct, ℈j to ʒj.

Adulteration. Apt to contain a little sulphate, for the carbonate is made from the sulphate; also lime, as the sulphate is often obtained from Dolomite, a magnesian lime-stone; lastly, some carbonate, from imperfect calcination: these can be all detected by the above tests.

Magnesiæ Carbonas *Lond.* Carbonate of Magnesia.

Prep. LOND. (Sulphate of magnesia, ℔s. iv; carbonate of soda, ℔s.iv. ℥ix; distilled water, boiling, four gallons. Dissolve the carbonate and sulphate, separately, in two gallons of the water, and strain; then mix the solutions and boil, stirring constantly with a spatula for two hours, distilled water being frequently added, so that it may fill about the same measure; lastly, the liquor being poured off, wash the precipitated powder with boiling distilled water, and dry it.) In this process double decomposition takes place, with the formation of carbonate of magnesia and sulphate of soda.

Prop. & Comp. A light white powder with scarcely any taste, consisting of minute granules and granular prisms; insoluble in water; neutral, or very slightly alkaline in reaction; soluble in dilute sulphuric acid with effervescence, and from this solution bicarbonate of potash causes no precipitate, showing the absence of lime: when boiled in water, the fluid should give no reaction with either chloride of barium or nitrate of silver, indicating the absence of sulphates or chlorides. It is not a true carbonate, magnesia not having the power of holding a complete equivalent of carbonic acid; but, from Phillips's

analysis, a compound of hydrated magnesia with hydrated carbonate. Formula (4 Mg O, CO_2, HO+Mg O, 2 HO).

Therapeutics. Acts the same as magnesia, with the exception of producing an evolution of carbonic acid when it meets with acid in the alimentary canal, and hence sometimes produces uncomfortable distention.

Dose. Gr. x to ℈j, as an antacid; ℈j to ʒj as a purgative.

Adulteration. Lime and some sulphate may be present, as in the last preparation, detected by the above tests.

Magnesiæ Carbonas Ponderosum *Dub.* Heavy Carbonate of Magnesia.

Prep. Dub. (Sulphate of magnesia ℥x (avoirdupois); crystallised carbonate of soda ℥xij (avoirdupois); boiling distilled water, a sufficient quantity. Dissolve the sulphate of magnesia in half a pint, and the carbonate of soda in a pint of water; mix the two solutions, and evaporate the whole to dryness by means of a sand heat. Digest the residue for half an hour with one quart of boiling distilled water, and having collected the insoluble matter on a calico filter, treat it repeatedly with warm distilled water, until the washings cease to give a precipitate when suffered to drop into a solution of nitrate of barytes. Finally, dry the product at a heat not exceeding 212°.)

Prop. & Comp. A much heavier preparation than the last, consisting of minute microscopic spherical grains, the difference of form depending on the use of the hot saturated solutions of the salts. Composition and other properties as the last.

Therapeutics, &c. As the last. More convenient, being so much less bulky.

Magnesiæ Sulphas *Lond.* Sulphate of Magnesia; Epsom Salts.

Prep. Generally made, at the present time, from Dolomite, a magnesian lime-stone, consisting of the carbonates of lime and magnesia, by treating it with sulphuric acid, which dissolves out the magnesia, leaving the lime in the form of an insoluble sulphate of lime. Formerly it was prepared from bittern, the residual liquor left after the crystallisation of common salt from sea-water.

Prop. & Comp. In four or six sided colourless prisms, with from two to six terminal planes; as generally sold, it is in small acicular crystals; should not deliquesce in the air, but have a tendency to effloresce; soluble in water; should not give off

hydrochloric acid fumes when treated with sulphuric acid. Composition (Mg. O, SO_3+7 HO).

Therapeutics. In ordinary doses it acts as a saline purgative, causing a pretty free secretion of watery fluid from the canal. In small doses, and freely diluted, it causes diuresis. Epsom salts are employed very frequently either alone or in combination; and are especially adapted to the treatment of febrile affections, and also where the portal system is congested: with the infusion of senna they form the ordinary black draught.

Dose. As a purgative, ʒij to ℥ß, or more; in combination, from ʒj upwards; as a diuretic, ℈j to ʒj.

Adulteration. When made from bittern it contains chloride of magnesium and sodium; it then deliquesces, and gives off hydrochloric acid fumes with sulphuric acid; it also precipitates nitrate of silver.

PLATINUM.

(Pt. Eq.=99.)

Platinum, a heavy, dull, white metal; sp. gr. 21; not acted on by any acid, only by chlorine, with which it forms the following salt.

Platini Bichloridum *Lond. Appendix.* Bichloride of Platinum.

Prep. By dissolving platinum in aqua regia, with heat.

Prop., Comp., & Use. The alcoholic solution, of a dark reddish-yellow colour, is used as a test for potassium, forming with the chloride of that metal a sparingly soluble double salt, and hence distinguishing potash from soda salts. Composition ($PtCl_2$). It also precipitates ammonia salts, and many of the alkaloids.

PLUMBUM. LEAD.

(Pb. Eq.=104.)

Metallic lead is not employed in medicine; but when individuals are exposed for a long time to its influence, as by handling it, they exhibit symptoms of slow poisoning.

Plumbi Oxidum (semivitreum) *Lond.* Protoxide of Lead, Litharge.

Prep. It is usually made during the cupellation of lead

ores containing silver, when the oxide becomes fused or semi-vitrified.

Prop. & Comp. Red or orange-red scales; soluble, or almost entirely so, in dilute nitric acid: the solution is precipitated black by sulphuretted hydrogen (hydrosulphuric acid), white by caustic potash, and re dissolved by it in excess: 100 grains, when converted into a sulphate by the addition of sulphate of soda to the solution in nitric acid, should yield 135 grains. Composition (Pb O).

Off. Prep. & Use. It is not used as litharge, but employed by the London College in the formation of

Emplastrum Plumbi, Lond. Plaster of Lead. (Oxide of lead, reduced to very fine powder, ℔ vj; olive oil, a gallon; water Oij. Boil them together over a slow fire, constantly stirring, until the oil and oxide of lead unite into the consistence of a plaster; but a little boiling water may be added, if that which was used at the first has evaporated before the end of the boiling.)

Unguentum Plumbi Compositum, Lond. Compound Ointment of Lead. (Plaster of lead ℔ iij; olive oil, f. ℥xviij; prepared chalk ℥vj; dilute acetic acid, f. ℥vj. Dissolve the plaster in the oil with a gentle heat; add first the chalk, then the acid, stirring constantly until they have cooled.)

Ceratum Saponis Comp. and Liquor Plumbi diacetatis are made with litharge, but in all these preparations other salts of lead, and not the oxide, exist.

Plumbi Iodidum *Lond.* Iodide of Lead.

Prep. Lond. (Acetate of lead ℥viij; iodide of potassium ℥vij; distilled water, a gallon. Dissolve the acetate in six pints of water, and strain; and to these add the iodide, first dissolved in two pints of water. Wash the precipitate with cold distilled water, and dry. Let it be kept, the access of light being prevented.) In this process iodide of lead and acetate of potash are formed by double decomposition.

Prop. & Comp. A yellow powder, or crystalline scales, soluble in boiling water, forming a colourless solution, and depositing crystals in cooling. Fuses and sublimes yellow, but soon gives off violet vapours from decomposition. From 100 grains dissolved in boiling diluted nitric acid, 66 grains of sulphate of lead are formed by the addition of sulphate of soda, after the iodine has been given off. Composition (Pb I). It is altered a little by light.

Off. Prep. Unguentum Plumbi Iodidi, Lond. Ointment of Iodide of Lead. (Iodide of lead ℥j; lard ℥viij. Rub them together.)

Therapeutics. Externally applied, iodide of lead acts as a mild stimulant, and has been used in the form of ointments to enlarged scrofulous joints, &c. It is seldom used internally, but has been given in scrofulous tumours.

Dose. Gr. ¼ to gr. j, or more.

Plumbi Acetas *Lond.* Acetate of Lead; Sugar of Lead.

Prep. By dissolving litharge in dilute acetic acid, evaporation and crystallisation.

Prop. & Comp. Generally in white spongy-looking masses, composed of interlaced acicular crystals; it may be obtained in large, flat four-sided prisms; has a sweetish, acetous odour, and sweet, metallic taste; effervescing slightly in the air; soluble in water; precipitated white by carbonate of soda, yellow by iodide of potassium, and black by sulphuretted hydrogen; treated with sulphuric acid, acetic vapours are given off: 100 grains yield, with sulphate of soda, 80 grains of sulphate of lead. Composition ($PbO, \bar{A} + 3HO$),

Off. Prep. CERATUM PLUMBI ACETATIS, LOND. Cerate of Acetate of Lead. (Powdered acetate of lead ʒv; white wax ℥v; olive oil Oj. Dissolve the wax in eighteen fluid ounces of the oil; to these gradually add the acetate, separately triturated with the remainder of the oil, and stir with a spatula until they unite.)

Therapeutics. Acetate of lead in small doses acts as a sedative and astringent, lessening morbid mucous discharges and hæmorrhages, and even diminishing the natural secretions; hence producing constipation, thirst, and a species of colic named Painters' or lead colic, accompanied by a peculiar blue line on the gums (a valuable diagnostic sign): when continued for some time, it renders the pulse smaller, and induces wasting of the body; it also produces an influence on the nervous system, shown by loss of power of the extensors of the hand, sometimes complete paralysis and apoplexy. The serious symptoms above described are, for the most part, brought on by contact with lead in various occupations, and not often by its employment as a medicine. Acetate of lead is much used in hæmorrhages from various organs, also in chronic diarrhœa and dysentery; in phthisis to check expectoration and excessive sweating. Externally it is sedative and astringent, and is used in skin affections and over inflamed parts.

Dose. Gr. ½ to gr. iij, or more.

Liquor Plumbi Di-acetatis *Lond.* Solution of Diacetate of Lead.

Prep. LOND. (Acetate of lead, ℔s. ij. ℥iij; oxide of lead, reduced to powder, ℔j ℥iv; distilled water, Ovj. Boil them for half an hour, frequently stirring, and when the liquor is cold, add of distilled water as much as may be necessary, that it may accurately measure six pints; lastly, strain. Let it be kept in well-closed vessels.) By the action of the litharge on acetate of lead, a sub-salt is formed by an additional equivalent of the oxide entering into the composition of the salt.

Prop. & Comp. A clear colourless liquid, sp. gr. 1·260, with an alkaline reaction, and sweet, astringent, metallic taste; agrees with the acetate in most of its properties, except that it precipitates gum from solution as well as mucilage.

Off. Prep. LIQUOR PLUMBI DI-ACETATIS DILUTUS, LOND. Dilute Solution of Diacetate of Lead. (Solution of diacetate of lead, f.ʒjß; distilled water, Oj; proof spirit, f.ʒij. Mix.)

CERATUM PLUMBI COMPOSITUM, LOND. Compound Cerate of Lead. (Solution of diacetate of lead, f.℥vj; wax ℥viij; olive oil Oj; camphor ʒj. Mix the melted wax with sixteen fluid ounces of the oil, then remove them from the fire, and when they begin to thicken, add gradually the solution of acetate of lead, and stir constantly with a spatula until they have cooled; lastly, mix the camphor with them dissolved in the remainder of the oil.)

Therapeutics. This preparation is only used externally, when it acts as an astringent and sedative; and under the form of the dilute solution, is most commonly employed when the topical action of lead is desired.

POTASSIUM.

(K. EQ.=39.)

This metal, called also Kalium, does not exist native, but can be obtained from potash salts; when pure, it has a metallic lead colour; sp. gr. 0·86; rapidly oxidises, and is converted into potash or the protoxide, which is contained in the following preparations.

Liquor Potassæ *Lond.* Solution of Potash.

Prep. LOND. (Carbonate of potash ℥xv; lime ℥viij; boiling distilled water, a gallon. Dissolve the carbonate in half a gallon of water, sprinkle a little of the water on the lime in an earthen vessel, and after slaking the lime, add the rest of the water. Mix the solutions immediately in a closed vessel, and shake

them frequently until they are cold. Then set by, that the carbonate of lime may subside. Lastly, keep the supernatant fluid, when poured off, in a well-stoppered green-glass vessel.) In this process the lime, on account of its affinity for carbonic acid, abstracts it from the carbonate of potash, and thus carbonate of lime, which is insoluble, is precipitated, and potash remains in solution.

Prop. & Comp. A colourless liquid, with intensely acid and caustic taste; sp. gr. 1·663, containing 6·7 per cent. of potash (KO); should give no precipitate, or scarcely any, with lime-water, showing the absence of carbonic acid; and after being neutralised with nitric acid, should not precipitate with carbonate of soda, chloride of barium, or nitrate of silver, indicating the absence of sulphates or chlorides: it gives with bichloride of platinum, the yellow double salt. It injures glass containing lead by partially dissolving it; hence it is ordered to be kept in green glass bottles.

Therapeutics. Liquor potassæ, in large doses and undiluted, is a violent caustic poison; but taken into the stomach in a diluted form it acts at first as a direct antacid, neutralising any free acid in the stomach; it also produces a powerful sedative effect upon the mucous membrane. After absorption into the blood, it possesses the power of increasing the change of tissues in the body, acting as an alterative, especially on the glandular system and on the secreting and excreting organs: it, doubtless, renders the blood more alkaline, and the fibrin less plastic; but, from the small amount which can be taken on account of its causticity, never produces alkalinity in the urine previously strongly acid. It is used as an antacid in dyspepsia, but in inflammatory forms of this affection its value depends more upon its sedative powers; it is also used in skin affections, and is especially useful when they depend upon a morbid condition of the stomach, as seen in erythema and other cutaneous diseases. As a blood alterant, liquor potassæ has been employed in inflammation of serous membranes, attended with fibrinous depositions, as pleuritis, pericarditis, and periostitis; also in scrofula, syphilis, and chronic rheumatism. Recently, however, iodide of potassium has replaced this medicine in a great measure as an alterative. For the further action of potash, *vide* Potassæ Bicarbonas. Externally, when freely diluted, liquor potassæ may be employed as a wash in some chronic skin diseases.

Dose. ♏x to f.ʒj, freely diluted.

Adulteration. Carbonate and sulphate of potash, chloride of

potassium, and lime, all of which can be detected by the above-given tests.

Potassæ Hydras *Lond.* Hydrate of Potash, or Hydrate of Potassa.

Prep. LOND. (Solution of potash, a gallon. Evaporate in a clean iron vessel over a fire, until the ebullition being finished, the hydrate of potash liquefies: pour this into proper moulds.)

Prop. & Comp. It is usually moulded for medical purposes into small sticks about the size of a pencil, white, greenish, bluish or reddish-brown from impurities; it quickly deliquesces when exposed to air, and, if pure, dissolves in rectified spirit; it dissolves animal tissues, forming a kind of soap with them. Composition (HO, KO); the equivalent of water cannot be driven off by heat.

Off. Prep. POTASSA CUM CALCE, LOND. Potash with Lime. (Hydrate of potash, lime, each ℥j. Rub them together, and keep them in a well-closed vessel.) This preparation, which is only a mixture of the hydrate of potash and lime, should slake when water is sprinkled upon it, and evolve no bubbles of carbonic acid on the addition of any acid.

Therapeutics. The hydrate of potash, and also its mixture with lime, are used only externally, as caustics, for the formation of sloughs, for touching ulcers, &c.; the advantage of the latter depends on its being much less deliquescent: it is applied as a paste made with spirit.

Adulteration. The same as of liquor potassæ; besides which, oxides of iron and alumina are often present; these are not soluble in spirit.

Potassæ Carbonas *Lond.* Carbonate of Potash.

Prep. From pearl-ashes (made from the ashes of wood) by solution in a small amount of water and crystallisation, in which process most of the other salts contained in the wood are left undissolved. By heating the crystallised bicarbonate to redness, a very pure dry carbonate of potash is obtained.

Prop. & Comp. Small white and rather opaque crystalline grains, having a strong alkaline taste; it deliquesces in the air, and is almost entirely soluble in water (quite so, if pure); when neutralised with nitric acid, the solution is not precipitated by carbonate of soda or chloride of barium, and scarcely so by nitrate of silver; loses 16 per cent. of water at a high temperature, and yields 26·3 per cent. of carbonic acid when dilute

sulphuric acid is added to it. Composition (KO, CO_2+2 HO). It should be kept in a well-stoppered bottle.

Off. Prep. Liquor Potassæ Carbonatis, Lond. Solution of Carbonate of Potash. (Carbonate of potash ℥xx; distilled water Oj. Dissolve and strain.) The specific gravity of this solution is 1·473.

Therapeutics. Almost the same as of liquor potassæ, but is less caustic, and hence more of the alkali can be introduced into the system; after absorption its effects are the same. Sometimes employed externally.

Dose. Gr. x to ʒß; of the liquor potassæ bicarbonatis, ♏xx to f.ʒj.

Adulteration. Sulphates and chlorides are very apt to be present; detected by the tests above given.

Potassæ Bicarbonas *Lond.* Bicarbonate of Potash, in crystals.

Prep. Made by passing a stream of carbonic acid through a solution of the carbonate in water unto saturation, and subsequent crystallisation.

Prop. & Comp. Large transparent colourless crystals, with a mild alkaline taste; soluble in about four times its weight of water. The solution, when cold, does not precipitate sulphate of magnesia; effervesces with nitric acid; and the supersaturated solution is not precipitated by chloride of barium, or scarcely by nitrate of silver. The salt loses 30·7 grains of water and carbonic acid when heated. Composition (K O, C O_2+H O, C O_2).

Therapeutics. Bicarbonate of potash acts as a direct antacid, but does not produce the sedative effect of liquor potassæ upon the stomach; it may be taken in very large doses, and is readily absorbed. It renders the blood and urine strongly alkaline and probably many other secretions; hence it is a powerful alterative; the action of the kidneys is likewise often increased. It is used in dyspepsia as an antacid; also in urinary affections where there is excessive deposit of uric acid. The author has employed it for the last three years with much success in the treatment of acute rheumatism, giving it in large and frequently repeated doses, and keeping the urine intensely alkaline for two or three days after the joint symptoms have subsided. This treatment appears to reduce the disease to an average of about ten days, and to diminish greatly the tendency to acute cardiac inflammation. The author also proposed, some years

since, the use of potash salts in the treatment of scorbutus, or true scurvy, which he considered to be due to a diminution of this base in scorbutic diets: he has had no reason to alter his opinion; and many facts have recently been made known by others, tending to confirm his view.

Dose. Gr. xv to ℨß as an antacid, &c.; in acute rheumatism, ℨß to ℈ij every two hours, freely diluted with water.

Adulteration. It is apt to contain carbonate of potash, which can be detected by its precipitating sulphate of magnesia.

Potassæ Acetas *Lond.* Acetate of Potash.

Prep. Lond. (Acetic acid, f.℥xxvj; carbonate of potash ℔j, or as much as may be necessary; distilled water, f.℥xij. Add the carbonate gradually to the acid, first mixed with the water to saturation; then strain. Evaporate the liquor in a sand-bath, the heat being cautiously applied, until the salt is dried.) Simply a substitution of acetic for carbonic acid, which comes off with effervescence.

Prop. & Comp. Foliated satiny masses, this appearance being caused by the crystallisation after fusion; neutral in reaction, and deliquescent; very soluble in water, also in alcohol. Should not precipitate with chloride of barium or nitrate of silver; or if the silver salt does precipitate it, this is again dissolved by water or dilute nitric acid. With sulphuric acid it gives off vapours of acetic acid, and yields 88·8 per cent. of sulphate of potash. Composition (K O, $\bar{A}$).

Therapeutics. When taken internally in moderate doses and diluted it becomes absorbed, and the acetic acid, being destroyed or burnt off in the blood, appears in the urine as carbonate, rendering that fluid alkaline, and often increasing the secretion: if large doses and concentrated, it produces a slight purgative action. It is used chiefly for its diuretic action, in various forms of dropsies; sometimes to produce the alkaline effects on the blood and secretions detailed under Bicarbonate of Potash.

Dose. Grs. x to ℨj as a diuretic; as a purgative, ℨij, upwards.

Adulteration. It may contain traces of sulphates and chlorides, detected by the above tests. Acetate of silver is rather insoluble, and hence may be precipitated if the solution is very concentrated.

Potassæ Tartras *Lond.* Tartrate of Potash.

Prep. Made by boiling the bitartrate with carbonate of

potash, when an equivalent of water in the acid salt is replaced by one of potash, and carbonic acid given off.

Prop. & Comp. Small granular crystals, usually without distinguishable shape; its real form is a right rhombic prism; neutral, deliquescent, very soluble in water. The solution precipitates bitartrate on the addition of all strong acids; and chloride of barium and acetate of lead should give no precipitate insoluble in dilute nitric acid. Composition (2 K O, T̄), tartaric acid being bibasic.

Therapeutics. In small doses it acts as a diuretic, and is changed into the carbonate in the same way as the acetate: in larger, it is purgative, producing watery evacuations.

Doses. As a diuretic and alterative, ℈j to ʒj; as a purgative, ʒij to ℥ß.

Adulteration. Some sulphates may be present; detected by the lead or baryta tests above given.

Potassæ Bitartras *Lond.* Bitartrate of Potash; Cream of Tartar, crystallised.

Prep. From argol, the deposit which occurs on the inside of wine-casks, by purification with charcoal and clay, it is called Cream of tartar, from the purest crystals being skimmed off the saturated solution while evaporating.

Prop. & Comp. Very fine, hard, white, crystalline powder; in small oblique rhombic prisms; acid, slightly soluble in water; converted by a red heat into carbonate of potash. Composition (H O, K O, T̄).

Off. Prep. Contained in Pulv. Jalapæ Comp. *Lond.*

Therapeutics. In small doses, refrigerant and somewhat diuretic; in larger, powerfully hydragogue purgative, without producing much depression. Employed to form an acid drink in febrile and dropsical affections, and as a purgative in dropsies, depending upon renal or cardiac disease.

Dose. As a refrigerant or diuretic, ℈j to ʒj; as a hydragogue purgative, ʒij to ℥j.

Adulteration. Often contains a little tartrate of lime; detected by the use of oxalate of ammonia.

Potassæ Sulphas *Lond.* Sulphate of Potash.

Prep. From the residuum of the distillation of nitric acid when made by treating nitre with sulphuric acid, the excess of sulphuric acid being driven off by a strong heat, and the salt dissolved and crystallised.

Prop. & Comp. Hard semi-transparent crystals, six-sided prisms, terminated by corresponding pyramids; of a bitter saline taste, and slightly soluble in water. It is precipitated yellow by bichloride of platinum; white, by chloride of barium, which last is insoluble in nitric acid. Crepitates and afterwards fuses at a red heat without losing weight. Yields 132 per cent. of sulphate of baryta. Composition (K O, S O_3).

Off. Prep. It is contained in Pulv. Ipecacuanhæ Comp.

Therapeutics. Mildly purgative. Almost always given in combination; by some it is supposed to be alterative, acting on the secreting and excreting organs; latterly evidence has been given of its acting as a poison in large doses. It is often used on account of its mechanical properties for the purpose of more intimately dividing vegetable substances.

Dose. ℈j to ʒij as a purgative; in smaller doses as an alterative.

Potassæ Nitras *Lond.* Nitrate of Potash; Nitre.

Prep. Certain soils in India contain nitrates of lime and potash; these, by being treated with wood ashes (carbonate of potash), yield nitrate of potash and carbonate of lime; the former is dissolved out and crystallised.

Prop. & Comp. Six-sided prisms, transparent, striated, with a peculiarly cooling taste, soluble in water, not precipitated by chloride of barium or nitrate of silver; fuses, but does not lose weight unless the heat is intense, when it gives off oxygen, and is converted into nitrite of potash, which last yields nitrous vapours when treated with sulphuric acid; deflagrates with heated charcoal, and forms carbonate of potash; when treated with sulphuric acid, it yields 85 per cent. of sulphate of potash. Nitric acid can be shown to be present by dissolving the salt in a little water, adding an equal bulk of sulphuric acid, and, when the mixture has cooled, a few drops of a solution of protosulphate of iron, a dark olive colour is produced, which is very characteristic.

Therapeutics. Nitre is refrigerant and diuretic, it also produces some alteration in the condition of the blood, and a powerful sedative action upon the heart and vascular system. It is used in small doses as a refrigerant and diuretic in febrile affections, to allay irritation of the mucous membrane of the stomach in inflammatory forms of dyspepsia; in large doses, as a vascular sedative in febrile affections, and especially in acute rheumatism. In dropsical affections, its action on the kidneys has sometimes proved useful.

Dose. Gr. v to ℈j, as a refrigerant and diuretic; ℈j to ʒj, as a vascular sedative.

Adulteration. It may contain traces of sulphate or chloride; detected by chloride of barium and nitrate of silver: lime, if present, would yield a precipitate with oxalate of ammonia.

Potassæ Chloras *Lond.* Chlorate of Potash, formerly called Oxymuriate of Potash.

Prep. By passing a stream of chlorine gas through a solution of carbonate of potash; when saturation has taken place, chlorate of potash and chloride of potassium result; the former readily crystallising out on account of its sparing solubility.

Prop. & Comp. Colourless transparent tabular crystals with four or six sides; have a cooling taste; sparingly soluble in water, especially when cold: the solution gives no precipitate with nitrate of silver; when a few drops of sulphuric acid are dropped upon the crystals, they become orange-red and give off yellow vapours of peroxide of chlorine; when the salt is rubbed with sulphur in a mortar, it detonates. Composition (KO, $Cl\,O_5$); when heated, it first liquefies and then gives off oxygen, nearly 39 per cent., and chloride of potassium (KCl) remains.

Therapeutics. It acts as a refrigerant and diuretic in a manner similar to nitre; has been supposed to give oxygen to the system, but this is doubtful: it has, however, been employed in low fevers, as scarlatina maligna, typhus and typhoid fevers, also in cancrum oris and other sloughing ulcers about the mouth and fauces.

Dose. Gr. x to ℈j, or more.

Adulteration. Chloride of potassium may be present, detected by nitrate of silver.

Potassii Iodidum *Lond.* Iodide of Potassium.

Prep. First form an iodide of iron, by bringing together iodine and iron with water, at a moderate heat; then add carbonate of potash to the solution, when carbonate of iron and iodide of potassium are formed; the former salt being separated by filtration, the solution by evaporation yields the latter in a crystallised state.

Another mode of preparing this salt consists in adding iodine to a solution of potash, when the following changes ensue ($6\,KO + I_6 = 5\,KI + KO,\ IO_5$). The mixture of the two salts, namely, the iodide of potassium and iodate of potash, is heated to redness, by which means the iodate of potash is converted into iodide of potassium, by parting with its oxygen.

Prop. and Comp. White semi-transparent cubic crystals; without odour if pure, and of a saline taste; as met with in commerce. it usually has some odour of free iodine; very soluble in water, and in about six or eight parts of rectified spirit; the solutions should be neutral; with nitric acid and starch, the blue iodide of amylin is produced; but tartaric acid and starch should give no colour. Iodide of potassium, when treated with acetate of lead, gives rise to a yellow precipitate of iodide of lead, soluble in boiling water; but it does not alter lime-water, or chloride of barium; with nitrate of silver a pale yellow iodide falls, insoluble in solution of ammonia, and amounting to 141 per cent. of the potash salt employed. Composition (KI).

Off. Preps. EMPLASTRUM POTASSII IODIDI, LOND. Plaster of Iodide of Potassium. (Iodide of potassium ℥j; prepared frankincense ℥vj; wax ʒvj; olive oil, f.ʒij. Add the iodide, first triturated with the oil, to the frankincense and wax melted together, and stir constantly until they cool. This plaster is to be spread on linen rather than leather.)

LIQUOR POTASSII IODIDI COMPOSITUS, LOND. Compound Solution of Iodide of Potassium. (Iodide of potassium, gr. x, iodine, gr. v; distilled water, Oj. Mix, that they may be dissolved.)

UNGUENTUM POTASSII IODIDI, LOND. Iodide of Potassium Ointment. (Iodide of potassium ʒij; boiling distilled water, f.ʒij; lard ℥ij. Dissolve the iodide in the water, then mix with the lard.)

Therapeutics. The action and uses of this drug have been described under *Iodine*; it does not possess the local irritant properties of free iodine, and hence is more adapted for internal administration. The plaster and ointment may be used when the slow action of the iodide upon a diseased part is desired; the compound solution, when we desire to give the combination of free iodine and the iodide; the latter salt rendering the iodine soluble in water.

Dose. Of iodide of potassium, gr. j to gr. x, or more. Of liquor potassii iodidi comp., f.ʒj to f.ʒß or more.

Adulteration. The salt may be damp, from the presence of water; it may also contain many impurities, as carbonate of potash, chlorides of sodium and potassium, iodate of potash (KO, IO_5), free iodine, &c., all detectable by the tests above given. When iodate of potash exists in the salt, from the second process of manufacture being adopted, and the imperfect ignition of the product, the ointment is apt to become yellow,

from the decomposition of the iodic acid by the animal matter. The tartaric acid test is introduced to detect this salt.

Potassii Bromidum. Bromide of Potassium.

Prep. The same as iodide of potassium, by either of the methods, substituting an equivalent quantity of bromine for iodine.

Prop. & Comp. White transparent cubic crystals, resembling the iodide; soluble in water and alcohol, but giving a yellow precipitate with starch and nitric acid. Composition (K Br).

Therapeutics. Described under *Bromine.*

Dose. Gr. v to gr. xv, and upwards. The author has given as much as ʒj, but it is then apt to produce unpleasant symptoms.

Adulteration. The same as those of the iodide, except that bromate of potash (KO, Br. O_5) may be present in place of the iodate.

Potassii Sulphuretum *Lond.* Sulphuret of Potassium; Hepar Sulphuris.

Prep. By mixing together sulphur and carbonate of potash, and afterwards heating the mixture in a crucible till they have combined.

Prop. & Comp. A brown liver-coloured mass, which is brittle, slightly deliquescent, having a strong odour of sulphuretted hydrogen, especially when moist, and an acrid disagreeable taste; soluble in water; the solution is precipitated by acids, with the deposition of sulphur, and strikes black with the salts of lead. It chiefly consists of tersulphuret of potassium (KS_3), with some hyposulphite and carbonate of potash.

Therapeutics. In small doses it acts as a stimulant diaphoretic and expectorant, and is sometimes employed in the treatment of chronic skin diseases, as scabies, and psoriasis; also in chronic rheumatism, and certain cases of bronchitis. Externally in the form of ointment, bath, or lotion, in the above-named affections. It is poisonous in very large doses.

Dose. Gr. iij to gr. vj, in pill. In ointment, ʒj to ℥j of lard.

Adulteration. When exposed, this compound becomes pale from decomposition, arising from oxidation and the formation of sulphate of potash.

Potassii Ferrocyanidum *Lond.* Ferrocyanide of Potassium; Prussiate of Potash.

Prep. This salt is always formed when carbonate of potash and animal matters, as hoofs, horns, &c., are heated together to redness along with iron, as in an iron pot, or with iron nails; from the incinerated mass, when cool, the salt can be dissolved out, and crystallised from the filtered solution.

Prop. & Comp. Large yellow, transparent, rhombic octahedrons, with truncated apices, having a saline and sweetish bitter taste; soluble in water; the solution is not altered either by alkalies or tincture of galls; it gives a precipitate with sulphate of iron, which at first is white, but soon changes to blue; with sulphate of copper a chocolate brown, and with sulphate of zinc a white precipitate. By heat it first loses 12·6 per cent. of water, and becomes white; is afterwards decomposed, leaving an ash soluble in hydrochloric acid, and precipitated by ammonia. This deposit, consisting of sesquioxide of iron, amounts to 18·7 per cent. of the salt. When heated with dilute sulphuric acid, an odour of hydrocyanic acid is evolved. Composition (2 KCy + Fe Cy + 3 HO), or a double cyanide of potassium and iron.

Use. It is employed in the preparation of hydrocyanic acid, and not used medicinally: although represented above as a double cyanide, the grouping of the elements is probably not in that form; for the salt is by no means poisonous even in large doses; there are also chemical, as well as therapeutic, reasons in favour of its containing a peculiar radical.

SOFT SOAP. A compound containing potash, will be described under Olive Oil.

SODIUM.

(NA. EQ.=23.)

This metal, called also Natrium, is contained in the soda salts, but does not exist native; when pure, it resembles silver in colour; sp. gr. 0·97; rapidly oxidises, and forms a protoxide, the alkali soda, contained in the following preparation.

Liquor Sodæ *Lond.* Solution of Soda.

Prep. LOND. (Carbonate of soda ℥xxxj; lime ℥ix; distilled water, boiling, a gallon. Prepare this in the same manner as directed for Solution of Potash.) The explanation of the changes in this process is exactly the same as for those which take place in forming Liquor Potassæ.

Prop. & Comp. A colourless liquid, with intensely caustic taste; sp. gr. 1·061, containing 4 per cent. of soda (Na O); in most of its other characters it resembles liquor potassæ, except that it is not precipitated by bichloride of platinum, or tartaric acid, and is so by a solution of antimoniate of potash, the antimoniate of soda being a very insoluble salt.

Therapeutics & Use. The action upon the system would probably be the same as that of liquor potassæ, but it is employed in the preparation of the oxysulphuret of antimony, and not as a remedy.

Sodæ Carbonas *Lond.* Carbonate of Soda.

Prep. Formerly derived from kelp or barilla, ashes obtained from burning sea-weeds, and species of salsola: it is now almost entirely made from common salt, by its conversion first into a sulphate with sulphuric acid, and afterwards resolving this salt into a sulphuret, and then a carbonate, by combustion with small coal and chalk; it is manufactured on a very large scale.

Prop. & Comp. In large rhombic octahedrons, colourless, transparent except on surface, with alkaline and caustic taste; effloresces and crumbles when exposed to air; very soluble in water; when saturated with hydrochloric acid it should give no precipitate with chloride of barium; contains 62 5 per cent. of water, which is driven off at a high temperature, and yields, when treated with dilute sulphuric acid, 15·28 per cent. of carbonic acid. Composition (Na O, CO_2+10 HO).

Off. Prep. Sodæ Carbonas Exsiccata, Lond. Dried Carbonate of Soda. (Carbonate of soda, ℔j. Apply heat to the carbonate, until the crystals fall to powder, and afterwards heat it to redness; lastly rub it to powder.) It is simply the last salts deprived of the water of crystallisation; it is soluble in water, and contains 40·7 per cent. of carbonic acid. Composition (Na O, CO_2).

Therapeutics. The action of carbonate of soda resembles that of the corresponding salt of potash, but is perhaps less caustic. Under Soda Bicarbonas will be found the general effect of soda salts.

Dose. Gr. x to ʒß. Of sodæ carbonas exsiccata, gr. v to gr. xv: this last is convenient when it is desired to administer the drug in powder or pill.

Adulteration. It may and does usually contain sulphate of soda, detected by the baryta tests above given.

Sodæ Bicarbonas *Lond.* Bicarbonate of Soda.

Prep. From the carbonate, in the same way as the bicarbonate of potash is prepared.

Prop. & Comp. It forms an opaque white powder, or minute crystals, slightly alkaline, and not caustic; soluble in water; does not precipitate with bichloride of platinum, nor with sulphate of magnesia, unless heated (this last negative test shows the absence of any carbonate): it gives no precipitate with chloride of barium, which is not soluble in hydrochloric acid, and yields 51·7 per cent. of carbonic acid when treated with a strong acid. It gives a precipitate with antimoniate of potash. Composition ($Na\,O, CO_2 + HO, CO_2$).

Therapeutics. Very similar to bicarbonate of potash, and almost all that has been stated of the action of that salt applies to this, except that the urate of soda is very much less soluble than the potash salt, and hence soda is less adapted for the treatment of this diathesis. Other differences probably exist, but are not well made out. Some practitioners are of opinion that the bicarbonate of soda agrees better with the stomach than the potash salt, but this is questionable.

Dose. Gr. x to ʒj.

Adulteration. Carbonate and sulphate of soda in an effloresced state, detected by the magnesia and barium tests.

Sodæ Sulphas *Lond.* Sulphate of Soda; Glauber's Salts, in crystals.

Prep. By treating common salt with sulphuric acid in the process for making hydrochloric acid; it is found native, and exists in sea-water.

Prop. & Comp. It forms six-sided oblique rhombic prisms, which are deeply channelled; colourless, transparent, neutral, with a bitter saline taste; effloresces in air, soluble in water; from a dilute solution scarcely any precipitate is produced with nitrate of silver, showing only a trace of chloride to be present; contains 55·5 per cent. of water, and yields with chloride of barium 71 per cent. of sulphate of baryta. Composition ($Na\,O, SO_3 + 10\,HO$).

Therapeutics. It acts as a saline purgative, and in small doses as a diuretic; was formerly much employed, but at present sulphate of magnesia is substituted for it on account of its more agreeable taste. The so-called Cheltenham Salts consist chiefly of sulphate of soda.

Dose. ℥ß to ℥j. When effloresced, the dose is smaller.

Sodæ Sulphis, Sulphite of Soda.

Prep. By neutralising the bisulphite of soda by means of carbonate of soda, and crystallising. The bisulphite is formed by saturating a solution of carbonate of soda with sulphurous acid gas.

Prop. & Comp. White prisms, having a slight odour of sulphurous acid; soluble in water; composition ($NaO, SO_2 + 8 HO$).

Therapeutics. The same as sulphurous acid, and adapted for internal administration in cases of chronic vomiting connected with the presence of sarcinæ ventriculi in the stomach. It may also be applied in the form of lotion, *vide* Acidum sulphurosum.

Dose. ℈j to ʒj.

Sodæ Phosphas *Lond.* Phosphate of Soda; Tasteless Purging Salts, in crystals.

Prep. Formed by digesting bone ash (phosphate of lime) in sulphuric acid, neutralising the liberated phosphoric acid with carbonate of soda, filtering, and crystallising.

Prop. & Comp. Large, transparent, oblique, rhombic prisms, with mild saline taste, efflorescing in the air, very soluble in water, alkaline in reaction, is precipitated white by chloride of barium, the precipitate, phosphate of baryta, being soluble without effervescence in dilute nitric acid; with nitrate of silver it throws down the yellow phosphate, also soluble in nitric acid; loses 62·3 per cent. of water at a red heat, and the remaining salt dissolved in water precipitates nitrate of silver of a white colour, owing to the change of the tri-basic acid into pyro-phosphoric acid. Composition ($2 NaO, HO, PO_5 + 24 HO$).

Therapeutics. In large doses it acts as a mild saline purgative; in smaller ones as a diuretic, altering also the condition of urine, rendering it alkaline, and increasing its solvent power for uric acid; sometimes employed as a pleasant purgative for children and delicate persons, and frequently in the uric acid diathesis.

Dose. As a purgative, ℥ß to ℥j; as a diuretic, ʒß to ʒij; given in mutton broth it is almost tasteless.

Adulteration. It frequently contains a little phosphate of lime, which renders the solution milky.

Borax, Sodæ Biboras *Lond.* Borax, Bi-borate of Soda; in crystals.

Prep. Found native in Thibet, and imported from India as

tincal or crude borax; made in Tuscany by neutralising the boracic acid, obtained from the lagoons, with carbonate of soda.

Prop. & Comp. Flattened six-sided prisms, semi-transparent, with slight alkaline reaction and saline taste, effloresces; pretty soluble in water, especially when hot; and from this solution, on the addition of sulphuric acid, crystalline scales of boracic acid are thrown down; it loses its water, and fuses when heated. Composition ($Na, 2\ Bi\ O_3 + 10\ HO$).

Off. Prep. MEL BORACIS, LOND. Honey of Borax. (Powdered borax ʒj; honey ℥j. Mix.)

Therapeutics. It acts as a mild alkali upon the alimentary canal, and after absorption tends to render the fluids alkaline, and to produce diuresis: by some, other powers have been attributed to it, viz., a specific action upon the uterus, causing contraction. It is used sometimes as a diuretic and antacid, sometimes combined with ergot to produce expulsion of the placenta, and as an emmenagogue. Externally it is used mixed with honey, or as a gargle, to aphthous conditions of the tongue and throat, and in mercurial salivation.

Dose. ʒß to ʒj.

Liquor Sodæ Chlorinatæ *Lond.* Solution of Chlorinated Soda.

Prep. LOND. (Carbonate of soda ℔j; distilled water, f. ℥xlviij; chloride of sodium ℥iv; binoxide of manganese ℥iij; sulphuric acid, f. ℥ijß. Dissolve the carbonate in Oij of the water, then put the chloride and binoxide, rubbed to powder, into a retort, and add to them the sulphuric acid, previously mixed with f. ℥iij of the water, and cooled. Heat the mixture, and pass the chlorine first through f. ℥v of the water, and afterwards into the solution of carbonate above directed.)

Prop. & Comp. A colourless or pale yellow liquid, having the odour of chlorine, pungent taste, alkaline reaction, and the power of bleaching vegetable colours, turmeric paper being first made brown, and the colour afterwards speedily destroyed; by it indigo is also decolourised; when lime-water is added, a precipitate of carbonate of lime is thrown down; it contains in solution a peculiar compound of soda and chlorine, by many thought to be hypochlorite of soda ($Na\ O, Cl\ O$), together with bicarbonate of soda and chloride of sodium; when exposed to the air, from the absorption of carbonic acid, and more especially when an acid is added, free chlorine is evolved.

Off. Prep. CATAPLASMA SODÆ CHLORINATÆ, LOND. Cata-

plasma of Chlorinated Soda. (Boiling water, f. ℥vj; powdered linseed ℥ivß; solution of chlorinated soda, f. ℥ij. Stir constantly, add the linseed to the water by degrees, then mix in the chlorinated soda.)

Therapeutics. Internally it acts as an antiseptic and stimulant, and has been given with success in low malignant fevers, as scarlatina, &c. Externally, in the form of cataplasm or solution, it is applied to correct the fœtor of unhealthy or gangrenous parts, and also to stimulate to more healthy action; as a gargle it is useful in ulcerated sore throats, and in ulcerated mouths from the use of mercury.

Dose. ʒß, or more, diluted with f.℥j of water; or as a gargle, f.℥ß to f.℥j in the Oß.

The test of its goodness is the free evolution of chlorine when an acid is added to it.

Sodii Chloridum *Lond.* Chloride of Sodium; Common Salt; crystals. Found in Cheshire as rock-salt, and in brine springs; also in sea-water, &c.

Prop. & Comp. Transparent cubes, soluble in water and spirit, but not in absolute alcohol. Composition (Na Cl).

Therapeutics. A necessary article of food, contained in blood and other animal fluids. A deficiency of it causes disease, the production of worms, &c. In large doses it is emetic and purgative; in milder ones, it acts as a slight stimulant and alterative. Externally applied, it is also stimulant and rubefacient. Sometimes used in the form of sea-water as an emetic and purgative, and anthelmintic; also as an adjunct to clysters: its internal employment, however, is chiefly as a condiment. Sponging and bathing in salt water, aided or not with friction, is valuable in many affections, as chronic rheumatism, joint affections, &c.

Sodæ Potassio-Tartras *Lond.* Potassio-Tartrate of Soda; Rochelle Salt.

Prep. Made by saturating bitartrate of potash with carbonate of soda, when the basic equivalent of water is replaced by one of soda, and carbonic acid given off.

Prop. & Comp. Four or six sided prisms, generally occurring in half crystals, neutral in reaction, soluble in water. When sulphuric acid is added, bitartrate of potash is precipitated. Nitrate of silver and chloride of barium throw down no precipitate, or only such as is dissolved by water. Composition ($NaO, KO\,\bar{T}+8\,HO$).

Therapeutics. A mild saline purgative, in large doses; in smaller ones, diuretic; and producing an alkaline condition of the fluids in the same way as tartrate of potash: it is employed under exactly similar circumstances.

Dose. As a purgative, ℨij to ℥ß; as a diuretic, ʒß to ʒj.

Soap and Valerianate of Soda will be treated of under the heads of Olive Oil and Valerian.

STANNUM. TIN.

(Sn. Eq.=59.)

This metal is not, at the present time, often used as a medicine, but was formerly employed in the form of powder, *pulvis stanni*, which is still officinal in the Edinburgh and Dublin Pharmacopœias, as an anthelmintic, given in about half-ounce doses, mixed with honey, treacle, or some confection: it is supposed by some to act simply as a mechanical agent; by others, on account of hydrogen being liberated by the action of the gastric juice.

Stanni Protochloridum *Lond. Appendix.* Protochloride of Tin.

Prep. By dissolving tin in hydrochloric acid by the aid of heat.

Prop., Comp., & Use. The solution containing the protochloride of the metal (Sn Cl) is a powerful deoxidising agent; it gives with solutions containing gold, a purple colour, and is ordered to be used to detect the presence of free chlorine in hydrochloric acid. (*See* Acidum Hydrochloricum.)

ZINCUM. ZINC.

(Zn. Eq.=32·5.)

Zincum *Lond.* Zinc.

Prep. Obtained from the sulphuret, Blende, or the carbonate, Calamine, by distilling them with carbonaceous matters.

Props. A blueish-white crystalline metal, sp. gr. 6·86; soluble in dilute hydrochloric and sulphuric acids with evolution of hydrogen, also in nitric acid; the precipitate thrown down by ammonia is re-dissolved by excess of that reagent; used in pharmacy for the preparation of the chloride.

Zinci Oxidum *Lond.* Oxide of Zinc.

Prep. LOND. (Sulphate of zinc ℔j; sesquicarbonate of ammonia ℥vjß; distilled water, three gallons. Dissolve the sulphate and sesquicarbonate separately in twelve pints of water, and strain; then mix. Wash what is precipitated frequently with water; and, lastly, burn it in a sharp fire for two hours.) In this process a basic carbonate of zinc is first precipitated by the sesquicarbonate of ammonia, a portion of carbonic acid escaping during precipitation; and this carbonate is afterwards, by heat, converted into the oxide.

Prop. & Comp. A white or yellowish-white powder, without odour or taste; insoluble in water, but soluble in hydrochloric and other acids, and in ammonia or potash. In composition it is a protoxide (Zn O).

Off. Prep. UNGUENTUM ZINCI, LOND. Ointment of Zinc. (Oxide of zinc ℥j; lard ℥vj. Mix them together.)

Therapeutics. A tonic, especially to the nervous system; also somewhat astringent: locally applied, a slight astringent and desiccant. Used chiefly in chorea, hysteria, and epilepsy; and externally, to excoriated surfaces and slight ulcerations.

Dose. Gr. j to gr. x, or more, in pill or powder.

Adulteration. Chalk, carbonate of magnesia; detected by effervescing, and the special tests of these bodies. Starch has sometimes been used.

Calamina Præparata *Lond.* An oxide of zinc, prepared from calamine, the native carbonate of zinc by heat, reduction to a fine powder, and elutriation.

Prop. & Comp. A greyish powder, almost entirely soluble in dilute sulphuric acid, with scarcely any effervescence; and the precipitate thrown down by ammonia or potash is re-dissolved by excess of these reagents.

Off. Prep. CERATUM CALAMINÆ, LOND. Cerate of Calamine. (Prepared calamine, wax, of each, ℥vijß; olive oil, Oj. Mix the oil with the melted wax, then remove them from the fire, and when they first begin to thicken add the calamine, and stir constantly until they cool.)

Therapeutics. Only used externally as a desiccant; it possesses no advantages over the pure oxide of zinc.

Adulteration. Often, as found in shops, it contains little or none of the oxide of zinc; but consists of sulphate of baryta, coloured; detected by its weight and insolubility.

Zinci Chloridum *Lond.* Chloride of Zinc.

Prep. Lond. (Hydrochloric acid Oj; distilled water Oij; zinc broken into small pieces ℥vij. Mix the acid with the water; to them add the zinc; when the effervescence has nearly ceased, apply heat until bubbles are no longer evolved. Pour off the liquor, strain, and evaporate until the salt is dried. Having melted this in a lightly covered crucible by a red heat, pour it out on a flat and smooth stone. Lastly, when it has cooled, break into small pieces, and keep in a well-stoppered vessel.) Zinc dissolves in dilute hydrochloric acid, with displacement of the hydrogen of the water; the solution is then evaporated, and the dried salt heated to redness, in order to drive off the water, which is retained with much force.

Prop. and Comp. A white, crystalline, semi-transparent mass, rapidly absorbing water if exposed to the air, and deliquescing; soluble in rectified spirit and water: the watery solution is precipitated white by sulphuretted hydrogen, and ferrocyanide of potassium, also by ammonia and potash, but re-dissolved by excess of these latter reagents; also precipitated by carbonate of soda, or potash, but not re-dissolved by them when in excess. Composition (Zn Cl). (In the Pharmacopœia, carbonate of ammonia is probably put for carbonate of soda; see Phillips's Pharmacopœia, edited by Mr. Denham Smith, who states that the salt of ammonia re-dissolves the precipitate.)

Therapeutics. When applied externally in substance, or made into a paste with flour or gypsum, it acts as a powerful escharotic; in solution, as a stimulant and astringent; internally, in small doses, as a nervine tonic. A solution of chloride of zinc, sp. gr. 2·0, is used as a deodoriser and disinfectant, under the name of Sir W. Burnett's Solution.

Dose. Internally, gr. $\frac{1}{2}$ to gr. j or ij.

Zinci Sulphas *Lond.* Sulphate of Zinc; in crystals; White Vitriol.

Prep. By dissolving zinc in dilute sulphuric acid, evaporating, and crystallising.

Prop. and Comp. In large or small crystals, of the same form as sulphate of magnesia; slightly efflorescent; soluble in water; precipitated and again re-dissolved by ammonia; the precipitate by chloride of barium, and acetate of lead, is not soluble in dilute nitric acid: 100 grains precipitated by sesquicarbonate of ammonia yield, when strongly heated, 27·9 grains of oxide of zinc. Composition ($Zn\ O, SO_3 + 7\ HO$).

Therapeutics. In small doses it acts as an astringent, and

nervine tonic; in large doses as a quick, direct emetic; externally, as a powerful astringent. It is used as a tonic chiefly in diseases of the nervous system, as in chorea, epilepsy, hysteria, and allied spasmodic affections; and when gradually increased, tolerance soon becomes established: sometimes it is given as an astringent in chronic passive discharges, as in leucorrhœa, gleet, and bronchorrhœa. In large doses, as an emetic, it is used when the rapid emptying of the stomach is desired without the production of much depression, as in narcotic poisoning, phthisis, and dyspepsia. Externally, in solutions of different strengths, it is employed as a lotion or injection, as in ophthalmia, gleet, &c.

Dose. As a tonic, or astringent, gr. j to gr. x, or more, in pills, or dissolved; as an emetic, gr. x to ℈ß. Externally, from gr. j to ℈ß may be dissolved in an ounce of water: it is contained in Liq. Aluminis Comp.

ACETATE OF ZINC is officinal in the Dublin Pharmacopœia; it is sometimes made extemporaneously, and used externally, by adding a solution of sulphate of zinc to one of acetate of lead; it acts as a powerful astringent.

VALERIANATE OF ZINC will be described under the head of Valerian.

ALCOHOLIC AND ETHEREAL PREPARATIONS, AND CHLOROFORM.

Alcohol *Edin., Dub.* Alcohol (anhydrous, or absolute).

Prep. Ordered to be made by mixing Oj of strong or rectified spirits of wine, with ℥x (dilute) of freshly-burnt lime, and distilling with a chloride of zinc bath; rejecting the first two ounces, and not drawing off more than f. ℥xvj.

Prop. and Comp. A limpid, colourless liquid, of pungent, spirituous odour; very volatile; sp. gr. 0·795 or 0·794, rapidly absorbs water when exposed; it has very powerful solvent powers for certain substances, as alkaloids, pure alkalies, volatile oils, iodine, &c.; does not dissolve common salt, which is soluble in ordinary rectified spirit. Composition ($C_4 H_5 O+HO$).

Use. Not used as a medicine, but employed in the preparation of Liquor Arsenici et Hydrargyri Hydriodatis.

Spiritus Rectificatus *Lond.* Rectified Spirit, or dilute Alcohol.

Prep. Alcohol is a product of the vinous fermentation of sugar occurring in wine, malt liquors, &c.: these, when distilled, afford spirits, such as brandy and rum; and re-distilled, give rectified spirit. It is usually procured from malt.

Prop. and Comp. Similar in most of its properties to alcohol; sp. gr. 0·838; it should not be made cloudy by the addition of water, nor tinged red with sulphuric acid. It contains about 82 per cent. of absolute alcohol.

Off. Prep. SPIRITUS TENUIOR, LOND. Proof Spirit, or weak Alcohol.

Prep. LOND. (By adding to every 5 pints of rectified spirit, 3 pints of distilled water, at a temperature of 62° Fah.) It contains 48 per cent. of alcohol.

Use. Rectified spirit is employed in pharmacy in making many tinctures and spirits, where the substances contain a large amount of resin or volatile oil. *Proof spirit* is used when the drugs are not very rich in such principles.

Therapeutics. Externally, it is employed in the form of lotion.

Spiritus Vini Gallici *Lond.* Brandy, or Spirit distilled from French wine.

Prop. & Comp. Contains about 53 per cent. of alcohol, together with some volatile oil and œnanthic ether; it is almost white when first distilled, but in the cask acquires some colour, and it has often burnt sugar added to it to produce the same effect.

Off. Prep. MISTURA SPIRITUS VINI GALLICI, LOND. Brandy Mixture. (Spirit of French wine, cinnamon water, each, f.℥iv; the yolks of two eggs; sugar ℥ß; oil of cinnamon, ♏ij. Mix.)

Therapeutics. Brandy may be employed, either in the form of the above mixture or diluted simply with water, when it is desired to administer a powerful diffusible stimulus, or to keep up the action of the circulation in very low conditions of the system, as in prolonged syncope, typhoid or adynamic forms of fever, delirium tremens, and gangrena senilis; in small quantities it often assists digestion when taken with a meal, and is used with advantage in atonic dyspepsia. Externally it may be used, diluted with water, as a topical stimulant to threatened bed sores, cracked nipples, &c.

Vinum Xericum *Lond.* Sherry Wine.

Prop. & Comp. The physical properties of sherry are well

known; it contains about 15 per cent. of alcohol, together with colouring matter, œnanthic ether, and other ethereal compounds, imparting to it the peculiar bouquet, and certain salts, as bitartrate of potash, malates, and sugar.

Off. Prep. It is used in making the vina or wines of the Pharmacopœia, as Vinum Aloes, and Vin. Antimonii Potassio-Tartratis, &c. Cape and other white wines are often substituted for sherry.

Therapeutics. Wine may be given as a medicine in the same cases as brandy, where it is desirable to keep up the action of the circulating system; as a stimulant in dyspepsia, however, it is often inferior to brandy, from its tendency to become acid. The wines of the Pharmacopœia are sometimes objectionable when large doses are required, on account of the alcohol they contain; and the same applies to the administration of tinctures.

Cerevisiæ Fermentum *Lond.* Yeast of Beer.

Prep. During the fermentation of an infusion of malt, by the action of yeast, a fresh formation of the ferment (yeast) is produced from the albuminous principles contained in the malt.

Prop. & Comp. Yeast is a yellowish or greyish white, thick, frothy liquid, having a characteristic odour and peculiar bitter taste; under the microscope it is found to consist, for the most part, of separate vesicles; some, however, are combined together linearly, to form a fungus. The plant is now called the *Torula cerevisiæ.* In composition yeast resembles gluten or albumen, but it is in an active condition and possesses the property of exciting the vinous fermentation in saccharine solutions.

Off. Prep. CATAPLASMA FERMENTI, LOND. Yeast Cataplasm. (Beer yeast and water, heated to 100° Fah., each, f. ℥v; flour ℔j. Mix the yeast with the water; add the flour, and stir until a cataplasm is made. Place it near the fire until it rises.)

Therapeutics. Yeast, when externally applied, acts as a stimulant and antiseptic, and in the form of cataplasm or poultice is employed to correct the discharges of indolent ulcers. Internally it has been used in low states of the system, to prevent the formation of boils and carbuncles, and recently as a remedy in diabetes: in the latter disease much further proof of its efficacy is required.

Dose. From a dessert to a tablespoonful. Fresh yeast should be employed.

Æther *Lond.* Ether. (Formerly called Sulphuric Ether.)

Prep. Ether is prepared by the action of sulphuric acid upon

alcohol, the proportions of acid employed being much less than that used in the formation of *oleum æthereum*. The simplest mode of explaining the change is to suppose that the sulphuric acid abstracts water from the alcohol; intermediate products are, however, formed.

Prop. & Comp. A very volatile, colourless liquid, with agreeable fragrant odour and hot taste; sp. gr. 0·750, or under; is entirely dissipated in vapour when exposed, and has scarcely, if any, acid reaction; very inflammable, burning with a white flame: it coagulates the albumen of eggs, but not of blood; is a powerful solvent of a limited number of substances, such as fixed and volatile oils, resins, a few alkaloids, xyloidine (gun cotton), iodine, bromine, bichloride of mercury, &c. Ether can be procured of as low sp. gr. as 0·720 at 60° Fahr., and has the composition (C_4 H_5 O).

Off. Prep. SPIRITUS ÆTHERIS COMPOSITUS, LOND. Compound Spirits of Ether. (Ether, f.℥viij; rectified spirit, f.℥xvj; etherial oil, f.ʒiij. Mix.) Ether is also made use of in Pharmacy for preparing some tinctures, which are then called etherial tinctures, and collodion.

Therapeutics. Taken internally, ether is a powerful diffusible stimulant, more rapid and evanescent in its action than alcoholic fluids; it is used to expel flatus from the stomach, and allay pain and cramp in that organ, to diminish spasms in various other affections, as in spasmodic asthma, angina pectoris and hysteria. When applied externally, it produces cold, from the rapid evaporation, and is occasionally made use of as a refrigerant, in the reduction of hernia; if the vapour is confined, then rubefacient effects are produced. Inhaled in the form of vapour it acts in a manner not unlike chloroform, under which article the effects are described. *Vide Chloroformyl.*

Dose. Of ether ♏xx to ʒj; of compound spirits of ether, f.ʒß to f.ʒjß; this preparation is supposed to be more anodyne from the etherial oil contained in it.

Adulteration. Ether may contain alcohol, which increases its specific gravity, and causes it to coagulate the serum of the blood; this can be separated by washing the ether with water, which dissolves out the alcohol: water and sulphurous acid may also be present, adding to its weight, and giving an acid reaction; they are removed by distillation from carbonate of potash or lime. Half a pint of water is required to dissolve a fluid ounce of ether; if a less quantity takes it up, the ether is not pure, and probably contains alcohol.

Oleum Æthereum *Lond.* Ethereal Oil.

Prep. LOND. (Rectified spirit, ℔s. ij; sulphuric acid, f.℥xxxvj; solution of potash, distilled water, of each a fluid ounce, or as much as may be necessary. Mix the acid cautiously with the spirit. Let the solution distil until a black froth arises; then immediately remove the retort from the fire. Separate the lighter, supernatant liquor, and expose it to the air for a day. Add the solution of potash, first mixed with water, and shake all together; lastly, when sufficiently washed, separate the ethereal oil, which subsides.)

Prop. and Comp. An oily-looking fluid, having, when freshly prepared, an agreeable odour; sp. gr. 1·05; insoluble in water, and sinking in that fluid in the form of globules; soluble in alcohol and ether. Its composition is somewhat doubtful, but is generally considered a mixture of two compounds; one a sulphate of ether, the other a sulphate of etherine ($C_4 H_5 O, SO_3 + C_4 H_4 SO_3$): other formulæ have been proposed.

Off. Prep. It is contained in Spiritus Ætheris Compositus.

Therapeutics. Supposed to have some narcotic as well as stimulant properties; but its action has never been properly investigated; and from our present knowledge of its value, it might well be omitted from the Pharmacopœia, especially as it is very apt to decompose, and is scarcely ever properly prepared. It is never given alone.

Adulteration. It is stated that much of the liquid called Ethereal Oil does not contain five per cent. of that body. After being kept for a time, sulphurous acid is formed.

Spiritus Ætheris Nitrici *Lond.* Spirits of Nitric Ether.

Prep. LOND. (Rectified spirit, Oij; nitric acid, f.℥iijß. Add the acid by degrees to the spirit, and mix; then let 28 fluid ounces distil.) Nitric acid, when mixed with alcohol, is decomposed into nitrous acid (NO_3) and oxygen; the nitrous acid unites with ether produced from the alcohol, and forms a nitrite of ethyl, which distils over with alcohol and ether; other compounds are also formed in small quantities during the process, which become mixed with the product.

Prop. & Comp. A colourless liquid with an agreeable fruity odour, and slightly acidulous cooling taste; volatile and inflammable; sp. gr. 0·834; has usually a slight acid reaction, but should not give rise to effervescence when carbonate of soda is added: it frequently strikes deep olive colour with sulphate of iron from deutoxide of nitrogén, and also a greenish blue with tincture

of guaiacum. It consists of alcohol, holding in solution nitrate of ethyl ($C_4 H_5 O, NO_3$), with often some aldehyde ($C_4 H_3 O$), aldehydic acid ($C_4 H_3 O_2 + HO$), acetic acid ($C_4 H_3 O_3 + HO$), and deutoxide of nitrogen (NO_2). By keeping, the above acids increase in quantity, giving to the preparation a strong acid re-action.

Therapeutics. A stimulant, diaphoretic, and diuretic, chiefly used for the latter property in dropsies; occasionally as a diaphoretic in slight febrile affections: it also appears to act as a grateful refrigerant. It is popularly known by the name of Sweet Spirits of Nitre.

Dose. f.ʒß to f.ʒij.

Adulteration. Excess of acid, from being too long kept or improperly prepared; it then effervesces with carbonate of soda.

Chloroformyl *Lond.* Chloroform.

Prep. LOND. (Chloriated lime ℔s. iv; rectified spirit Oß; water Ox; chloride of calcium, broken into fragments, ʒj. Put the lime, first mixed with the water, into a retort; to these add the spirit, and let the mixture occupy only one-third of the retort. Heat in a sand-bath, and as soon as boiling commences, withdraw the fire as quickly as possible to prevent the retort bursting by the sudden increase of temperature; distil into a receiver until all the heavy liquid has passed over, re-heating if required. To the distilled liquid add four times as much water; shake well together. Carefully separate the heavier part which subsides, and add to it the chloride, shaking now and then for the space of an hour. Lastly, re-distil the liquor from a glass retort into a glass receiver.) Chloroform may be produced by several processes, but the above yields it purer and more advantageously than any other. When chlorine, from chlorinated lime, acts upon alcohol, many complicated and ill-understood decompositions ensue; the principal product, however, seems to be chloroform.

Prop. & Comp. A colourless heavy liquid, with a peculiarly agreeable, fruity, ethereal odour; sp. gr. from 1·48 to 1·50, but slightly soluble in water, sinking readily in that fluid: neutral in reaction; when rubbed on the skin it quickly evaporates, and, if pure, leaves no odour. Chloroform is a powerful solvent of caoutchouc, gutta percha, many resins, fats, and alkaloids, also of iodine and bromine. Composition ($C_2 H, Cl_3$), or a terchloride of formyl ($C_2 H$). When exposed to air and light, it is apt to decompose, hydrochloric acid and free chlorine being formed: it is stated that when chloroform is purified with oil

of vitriol, it is more liable to this change, but that re-distillation with carbonate of baryta gives it stability.

*Therapeutics.** When taken internally, chloroform appears to act as a narcotic and antispasmodic, not unlike ether; its sedative effects, however, are more distinctly marked, and it produces in large doses a general diminution of sensorial power, with drowsiness, and without exhilaration or acceleration of the pulse. It has been employed in spasmodic affections, as spasmodic coughs, asthma, cholera, lead colic, and hysteria; it has also been stated to act as a valuable sedative in cancer, neuralgia, and other painful affections, and has been even asserted to be antiperiodic, relieving sometimes when bark or quinine have failed. Externally, it has been used in medicine to allay pain and irritation in neuralgia, and certain skin affections attended with troublesome itching. For all these purposes, however, its application is very limited; its chief employment being in the form of vapour, for the production of its anæsthetic effects. When inhaled in small doses, it produces a slight species of inebriation, with some impairment of vision and common sensibility, consciousness remaining. The sensations produced by these small doses are usually of a pleasurable character; carried to this extent, it may be employed in the treatment of spasmodic and neuralgic affections. If the inhalation be still continued, the patient passes into a dreamy state, sometimes with considerable mental excitement, but with loss of common sensibility: it may be given to this extent when employed in natural labour: from these conditions the patient soon recovers on the cessation of the administration of the vapour. If the inhalation be carried still further, the patient loses the power of voluntary motion; there is an inclination of the eyes upwards, complete suspension of the mental faculties, with slight contraction of the muscles and rigidity of limbs. Although at this stage common sensibility appears quite destroyed, yet on the performance of surgical operations there may be indications in the features expressive of pain, and even moaning and inarticulate cries. When this condition has been kept up for some time, and the winking of the eyelids very much diminished, then is the proper period for the performance of surgical operations. If the effects be carried further, complete relaxation of the voluntary muscles takes place, but the sphincters remain con-

* The therapeutic action of chloroform is taken, with slight alteration, from an article written by the author in the last edition of the "London Dispensatory," to which work the reader is referred for a full description of many drugs, by the late Dr. A. T. Thomson.

tracted, the respiration goes on, though accompanied with slight stertorous breathing, the glottis continues sensible, but the sensibility of the pharynx appears to be diminished, so that in operations about the mouth blood frequently finds its way into the stomach; the iris is much less acted on by light, but not contracted. When the relaxation of the muscles has fully taken place, then the reduction of dislocations and hernia may be effected. If the inhalation is continued beyond this stage, symptoms indicative of danger succeed; the breathing becomes very stertorous, slow, and may altogether cease, and death takes place, sometimes accompanied with convulsions. Chloroform has been administered in the form of vapour in the treatment of tetanus, hydrophobia, colic, and painful spasmodic affections, as during the passage of renal calculi, or of gall-stones, &c.; in some of these cases its use has been followed by great relief. The first and second set of symptoms above mentioned may be generally produced by administering from half a fluid drachm to a fluid drachm, and repeating it in a few minutes if this condition is required to be kept up. When the inhalation is suspended, the patient, in the course of five or six minutes, recovers his consciousness, but without remembering any thing which has taken place. For the production of complete insensibility and relaxation more chloroform must be employed, and the effects carefully watched. If it has proceeded too far, ammonia, dashing cold water in the face, or even artificial respiration, must be had recourse to. In the administration of chloroform, several precautions should be taken. In the first place, the chloroform should be pure, that is, free from oily matter, hydrochloric acid, and uncombined chlorine; it should not be used at all, or, if so, with the greatest care, in persons suffering from any cerebral disease, or tendency to such, or organic cardiac affection. It may be administered in vapour either by means of a folded handkerchief applied over the face and nose, or by means of inhalers which are sold for this purpose; and care should be taken that the patient breathes atmospheric air at the same time as the chloroform vapour. Disagreeable symptoms sometimes occur after the inhalation of chloroform, as nausea, vomiting, head-ache: probably these may occasionally arise from impurities in the preparation. Ether, and the vapour of some other hydrocarbons, as benzin, Dutch liquid, bisulphuret of carbon, &c., when inhaled, produce effects not unlike those of chloroform, and before the discovery of this latter agent, pure ether was always made use of; the effects of which appear to be almost identical with those of chloroform, but the quantity requires to be much greater, from f.ʒj to f.ʒij.

It is stated by Dr. Snow that greater muscular relaxation is produced by ether than by chloroform. When chloroform is taken into the stomach, or exhibited in the form of vapour, it is absorbed into the blood, and Dr. Snow has thus discovered its presence in the blood of animals killed by this agent. Its detection can be effected by causing the vapour from the suspected fluid to pass through a red-hot tube, when the chloroform, if present, is decomposed and free chlorine evolved, which may be made to act upon nitrate of silver, or upon starch-paper impregnated with iodide of potassium.

Dose. Chloroform, when given in a liquid state, may be rubbed up with yoke of egg and mucilage, or syrup, or dissolved in spirit: the dose may be from ♏v to ♏xl. Externally, it may be employed as an embrocation or ointment: one part of chloroform should be added to from seven to eleven parts of any liniment, or it may be rubbed up with the same amount of lard. For inhalation the doses have been already indicated.

Adulteration. Hydrochloric acid and free chlorine, detected by their acid re-action and bleaching power, and by water to which it is added, precipitating nitrate of silver. Sometimes an oily matter, formed during the process, may be present, detected by its leaving an odour on evaporation, and being coloured by sulphuric acid.

Chloric Ether, improperly so called, is simply a solution of one part of chloroform, by measure, in five parts of rectified spirit.

Dose. From f. ♏xx to f. ʒj.

HYDROCARBONS FROM THE DESTRUCTION OF WOOD BY FIRE, OR FOUND NATIVE.

Creosotum *Lond.* Creosote, or Kreosote.

Prep. During the destructive distillation of wood in the preparation of pyroligneous acid, amongst other hydrocarbons Creosote is formed; also obtained from oil of tar, or pyroxylic oil, and is contained in the smoke from wood.

Prop. & Comp. A colourless transparent liquid, of peculiar strong odour and burning taste; sp. gr. 1·046; very slightly soluble in water, but soluble in acetic acid, alcohol, and ether; coagulates albuminous fluids, and has considerable preservative powers on both animal and vegetable matter; it should vola-

tilise entirely at 212° Fahr., and not leave a transparent stain on bibulous paper. Composition (C_{12} H_8 O_2).

Off. Prep. UNGUENTUM CREOSOTI, LOND. Ointment of Creosote. (Creosote, f.ʒß; lard ℥j. Rub them together.)

Therapeutics. Internally, in small doses, it acts as a stimulant to the stomach, and has been often used with success in arresting certain forms of vomiting, not connected with febrile disturbance of the system; it has been also given with temporary advantage in diabetes. Externally it allays toothache depending on caries, and forms a stimulant application to ulcers and chronic skin disorders, as porrigo; it is used also as a topical styptic in hæmorrhages: the vapour, mixed with that from hot water, is useful in checking excessive expectoration in chronic bronchitis, and correcting the fœtor of the sputa in dilatation of the bronchi, and in pulmonary abscess.

Dose. ♏j to ♏v, in pill, or rubbed up with mucilage, or with a few drops of acetic acid. As an inhalation, ♏iij to ♏x, or more, to the half-pint of boiling water.

Petroleum *Lond.* Barbadoes Tar.

Description. A black, bituminous liquid, exuding spontaneously from the earth, and found upon the surface of some lakes, especially in the islands of Barbadoes and Trinidad: it resembles treacle in appearance, has a dark red colour when seen by transmitted light through thin layers, and a peculiar bituminous or tar-like odour and taste: it is lighter than water; sp. gr. about 0·88.

Prop. & Comp. It is insoluble in water, but soluble in fixed and volatile oils, also in ether; inflammable, burning with a very smoky flame; very complex in composition, containing many different hydrocarbons, amongst which are *eupione* and *paraffine;* when exposed to the air, it hardens into a species of asphaltum.

Therapeutics. Very closely resembles tar and pitch in its action, being a stimulant, diaphoretic, and expectorant; by some thought to be anthelmintic: it has been employed chiefly in chronic squamous skin affections, rheumatism, and bronchitis. It may be employed internally or externally.

Dose. ʒß to ʒj, or more.

ORGANIC SUBSTANCES.

VEGETABLE KINGDOM.

VEGETABLES should be gathered in dry weather, and not when wet with rain or dew. They should be collected annually, and not be kept beyond a year.

Most roots and rhizomes should be dug up after the old leaves and stalks have fallen, and before the new ones appear.

Barks ought to be collected at the season in which they can be most easily separated from the wood; herbs and leaves should be gathered after the flowers have blown and before the seeds ripen.

Flowers should be gathered recently blown.

Fruits and seeds should be collected when ripe.

The different parts of vegetables should be kept dried for use, except when otherwise directed. Expose those which are to be dried, a short time after they have been gathered, in shallow wicker baskets to a gentle heat in a current air, in the dark; when the moisture is driven off, gradually increase the heat to 150° Fah., that they may dry. Finally, preserve the more delicate parts, viz., flowers and leaves, in black glass bottles, well closed, and the rest in vessels, preventing the access of light and moisture.

The above directions are given by the London College.

CLASS I. EXOGENÆ.

SUB-CLASS I. THALAMIFLORÆ.

RANUNCULACEÆ.

Helleborus *Lond.* The rhizome and root of the Helleborus niger, Christmas Rose, or Black Hellebore; Lin. Syst., Polyandria polygynia; inhabiting Central Europe, imported from Marseilles and Hamburg.

Description. Dark brown rhizomes with numerous rootlets; when cut, whitish internally.

Prop. & Comp. Taste very acrid and bitter, but sweetish at first; it has been stated to contain a crystalline principle, *Helleborin*, but this has not been as yet confirmed; besides which, gallic acid, an acrid oil, and resin, salts, &c., have been found.

Off. Prep. TINCTURA HELLEBORI, LOND. Tincture of Hellebore. (Hellebore, bruised, ℥v; proof spirit Oij. Macerate for seven days, then press and strain.)

Therapeutics. In full medicinal doses, it is a powerful drastic purgative, stated also to be emmenagogue: little used in this country at present; formerly employed in cerebral affections, as melancholia.

Dose. Of the powder, gr. v to ℈j; of the tincture, ʒß to ʒj.

Staphisagria *Lond.* The seed of Delphinium Staphisagria or Stavesacre; Lin. Syst., Polyandria trigynia; inhabiting chiefly the southern parts of Europe.

Description. The seed is irregularly triangular, of a brownish black colour, deeply pitted on the surface.

Prop. & Comp. No odour, acrid taste, contains an alkaloid, *Delphinia* ($C_{27}H_{19}N\,O_2$?), together with resin, fatty matter, wax, lignin, &c.

Off. Prep. None, used in powder or decoction.

Therapeutics. Stavesacre appears to act as an emetic and purgative, when given internally, and has been used as an anthelmintic; it seems also to possess narcotic properties. Externally it has the power of destroying pediculi.

Dose. Gr. iij to gr. x, in powder and decoction; very seldom used.

Podophyllum *U. S.* The rhizome of the Podophyllum peltatum, or American May-apple; Lin. Syst., Polyandria monogynia; called sometimes *Mandrake* in the United States, over which it is extensively diffused.

Description. A long thin rhizome about ¼ in. in thickness, brown, jointed, with numerous radicles, wrinkled longitudinally, breaks short, and is whitish internally; powder, greyish yellow, of a sweet odour and sweetish acrid taste.

Prop. & Comp. Alcohol and water extract much bitter matter; it yields to the former resinous matters, which, when separated by water, have been called *Podophylline*.

Off. Prep. EXTRACTUM PODOPHYLLI, U.S. Prepared by the successive action of alcohol and water on the powdered rhizome.

Therapeutics. Podophyllum acts as a drastic cathartic, very much like jalap; used as such in congestions of the liver or portal system, also with calomel, bitartrate of potash, &c., in dropsies. It often gripes, sometimes causes vomiting.

Dose. Of the powder, about ℈j; of the extract, gr. v to gr. xij; of podophylline, gr. ij to gr. iv.

Aconiti Folium et Radix *Lond.* The recent and dried leaf, and root of the Aconitum napellus, or Monkshood; Lin. Syst., Polyandria trigynia; a plant growing in most parts of Europe.

Description. The *leaves* are deep green on the upper surface, lighter beneath, smooth, five partite, the segments wedgeshaped and pinnately cut. The *root* is fusiform, like a carrot, with fleshy fibres, dark brown on the surface, whitish within. The *flowers* are purple, helmet-shaped, and in racemes.

Prop. & Comp. All parts of the plant are bitter and acrid, causing tingling of the lips and skin, followed by numbness; they contain an alkaloid, *Aconitina* ($C_{60}\ H_{47}\ N\ O_{14}$), united with *Aconitic acid* ($C_4\ H\ O_3$); probably another base is also present.

Off. Prep. EXTRACTUM ACONITI, LOND. Extract of Aconite. (Aconite leaves, fresh, ℔j. Bruise them in a stone mortar, express the juice and evaporate it, unstrained, to a proper consistence.)

TINCTURA ACONITI, LOND. Tincture of Aconite. (Aconite root, coarsely powdered, ℥xv; rectified spirit Oij. Macerate for seven days, then press and filter.)

TINCTURA ACONITI, DUB. (Made with ℥x of the root to one pint of rectified spirit.)

FLEMING'S TINCTURE OF ACONITE. (Made with ℥xvj of the dry and finely powdered root, by maceration and percolation, with rectified spirit into ℥xxiv of the tincture.) It is much more powerful than the London Tincture.

ACONITINA is not now officinal, although much employed externally. It is white, uncrystallisable, soluble in alcohol and ether, also in acid solutions. It exists in very small quantities in the root of Aconitum napellus, but is more abundant in that of Aconitum ferox.

Aconitine *Ointment* can be made by rubbing from gr. ½ to

gr. 4 of the alkaloid, first with a drop of oil, and then with ℥ij of lard. It should be cautiously used.

Therapeutics. Given internally in small doses, aconite produces tingling of the lips and tongue, a peculiar sensation at the palate and pharynx, and warmth at the epigastrium; in large doses tingling may occur in the extremities, followed by numbness, and a feeling of faintness, with weak and often intermitting action of the heart, and occasionally diuresis; pain, if present, is diminished or removed; if the dose is still larger, alarming symptoms of vascular depression are produced. Externally aconite causes at first a tingling of the part, succeeded by numbness, and cessation of local pain if previously present. It appears to cause contraction of the pupil, both when topically applied and when taken internally. Aconite has been used internally in the treatment of rheumatism, acute and chronic gout, neuralgia, and carcinomatous affections, to relieve pain; in hypertrophy and other diseases of the heart, to allay palpitation; in dropsies, on account of its occasional diuretic properties, &c.; but it is at the present time rarely employed as an internal remedy, on account of its powerful and often alarming effects. Externally applied it is often very valuable in the different forms of neuralgia, and in chronic rheumatic and gouty pains. *Aconitina* has the same properties as the Aconite leaf or root, and in fact imparts to the different parts of the plant their virtues; it is not given internally, as gr. $\frac{1}{50}$ may cause very powerful symptoms, but it is much used as an external remedy in the form of an ointment of different strengths. Sometimes much irritation of the skin is produced by its use.

Dose. Of tincture of aconite (Ph. Lond.), ♏ij to ♏viij; of Fleming's Tincture, ♏j to ♏iv; of extract of aconite (Ph. Lond.), gr. j to gr. iv. An *alcoholic extract* is often used, of which the dose should be from gr. $\frac{1}{6}$, gradually increased.

Adulteration. Aconitina is often very impure, being mixed with Delphinia, or from not having been separated from another principle contained in the root and precipitated with it. Pure aconitina in gr. $\frac{1}{50}$ dose will destroy a dog, sometimes gr. j of the spurious alkaloid can be given without much effect.

MAGNOLIACEÆ.

Cortex Winteri, Winter's Bark. The bark of Drymis Winteri, or Drymis aromatica; Lin. Syst., Polyandria tetra-

gynia; a large tree found by Captain Winter, in 1578, on the coasts of the Straits of Magellan. Grows also in Chili, Peru, and New Granada.

Description. It occurs in large quills, a foot or more in length and from one to two inches in width. The bark itself varies from $\frac{1}{8}$ to $\frac{1}{4}$ of an inch in thickness; externally it is reddish-yellow, with dark red spots; internally, cinnamon colour. It has a powerful aromatic odour, and hot taste.

Prop. & Comp. It contains a *volatile oil*, lighter than water, *resin*, and some *tannin;* hence its solutions strike black with salts of iron; in the analysis of this bark *sulphate of potash* and *oxide of iron*, and other salts, are given as constituents.

Therapeutics. A warm aromatic stomachic and tonic, useful in atomic dyspepsia. It was originally given in scurvy.

Dose. ℈ß. to ℈j, in powder, or made into an infusion.

Adulteration. Canella alba is often substituted for Winter's bark; it is distinguished by being much lighter in colour, especially on the inner surface, and containing no tannin, and no soluble sulphate; its infusion, therefore, does not strike black with iron salts, and is not precipitated by chloride of barium. Therapeutically the substitution is of little or no consequence.

Another plant belonging to this order, namely, the Illicium anisatum, or Star Anise, yields an oil resembling anise oil very closely, and often substituted for it.

MENISPERMACEÆ.

Calumba *Lond.* The root of the Cocculus palmatus, Calumba plant; Lin. Syst., Diœcia hexandria; sometimes called Columbo root; the name was supposed to be derived from Columbo, the modern capital of the Island of Ceylon, but it is imported from the Mozambique (Africa).

Description. It occurs in small cylindrical pieces, which are cut into thin disks. These vary in diameter from $\frac{1}{2}$ inch to about 2 or 3 inches, and in thickness from about $\frac{1}{4}$ to $\frac{1}{2}$ inch; central portion spongy, yellow, and in concentric layers; outer portion, dark green or olive; usually becomes concavo-convex in the drying.

Prop. & Comp. Very little odour, very bitter taste. It contains a neutral non-nitrogenised crystallisable principle, called *Calumbine* (C_{42} H_{22} O_{14}), little soluble in water or proof

spirit, an acid called *Calumbic* (C_{42} H_{21} O_{14}), and an alkaloid, *Berberine* (C_{42} H_{18} N O_{9}), of which the salts are soluble, and yellow; hence the colour of the root. The calumbate of berberine is yielded to the infusion and tincture. There exists also much starch in the root.

Off. Prep. Infusum Calumbæ, Lond. (Calumba, sliced, ℥v, boiling distilled water Oj. Macerate for 2 hours in a covered vessel, and strain.)

Tinctura Calumbæ, Lond. (Calumba, finely sliced, ℥iij. proof spirit Oij. Macerate for 7 days, then press and strain.)

Therapeutics. Calumba is a bitter stomachic and tonic, useful in debility of the digestive organs, hence valuable in the non-inflammatory forms of gastrodynia, pyrosis, and vomiting; also as a general tonic, especially in early convalescence from acute diseases; it is often usefully combined, in stomachic affections, with an alkali or alkaline bicarbonate, or with the nitrate of bismuth or prussic acid.

Dose. Of the powder, gr. x to ℈j or more; of the infusion, f. ℥j to f. ℥ij; of the tincture, f. ʒß to f. ʒij.

Incompatibles. The infusion of Calumba contains some starch in solution, and hence strikes blue with iodine. Calumba may be given with salts of iron, as it contains neither tannin nor gallic acid.

Adulteration. Tinged bryony root, also the root of the Frasera Walteri, and of a Menisperm from Ceylon, have been substituted for true calumba.

Pareira *Lond.* The root of the Cissampelas Pareira, or Velvet Leaf; Lin. Syst., Diœcia dodecandria; a plant growing in the West Indies and South America.

Description. It occurs in more or less cylindrical-shaped pieces, externally brownish, wrinkled both longitudinally and transversely; internally yellowish grey, with concentric circles and radiating rays, and very open or cancellated in structure.

Prop. & Comp. Odour very slight, taste sweetish and then bitter. It contains a crystalline nitrogenised principle, named Pelosine or Cissampeline (C_{36} H_{21} N O_{6}), a strong base; besides which there exists some resin, a bitter yellow matter, starch, salts, &c.

Off. Prep. Decoctum Pareiræ, Lond. Decoction of Pareira. (Pareira, sliced, ʒx; distilled water Ojß. Boil to a pint, and strain.)

EXTRACTUM PAREIRÆ, LOND. Extract of Pareira. (Ordered to be prepared as directed under Extractum Hæmatoxyli.)

Therapeutics. A bitter tonic as calumba, but scarcely ever used as such; it is thought to have an action on the mucous membrane of the bladder, and to act as a diuretic. Its use is chiefly confined to chronic catarrhal affections of that viscus to allay irritation and diminish the mucous discharge; it may be combined with nitric acid or an alkali, according to the state of the urine; used also in chronic pyelitis.

Dose. Of powder ʒß to ʒj; of the decoction f.℥iß to f.℥iij; of extract, gr. x to ʒß; this last is often added to the decoction.

Adulteration. Some roots and stems of other plants are stated to have been occasionally substituted; these have yielded much less extractive matter.

Cocculus Indicus *Edin.* The fruit of the Anamirta Cocculus, or Cocculus Indicus plant; Lin. Syst., Diœcia dodecandria; a climbing shrub growing in the East Indian islands and Malabar coast, &c.

Description. A berry, between a pea and a bayberry in size, consisting of a dark brown exterior, enclosing a wrinkled, bivalved shell, and a kernel semilunar and shrivelled in shape, which should, however, according to the Edinburgh College, fill at least two-thirds of the fruit.

Prop. & Comp. It contains a non-nitrogenised crystalline neutral principle *Picrotoxine* ($C_{12} H_7 O_5$) which resides in the kernel, and an alkaloid *Menispermine* ($C_{18} H_{12} N O_2$) united with an acid, *Cocculinic acid,* chiefly in the shell.

Off. Prep. UNGUENT. COCCULI, EDIN. (Made by rubbing the kernels with five times their weight of axunge, until they are very intimately united.)

Therapeutics. Cocculus Indicus, as well as picrotoxine, act upon the nervous system as intoxicating agents, apparently upon the cerebellum; they are not, however, used internally in medicine. Externally, Cocculus Indicus is employed to destroy pediculi, and occasionally in chronic skin diseases.

PAPAVERACEÆ.

Papaver *Lond.* The ripe fruit of Papaver somniferum; the Garden, or Opium Poppy, Lin. Syst., Polyandria monogynia; a native of Syria and Egypt, but cultivated in Europe.

Description. The ripe fruit, poppy-heads, or capsules, are globular, from two to four inches in diameter; of a pale brownish-yellow colour, smooth, with a radiating stigma on the top; within are parietal placentæ, and very numerous small, brownish, reniform seeds; the texture of the heads is light and papery, with little or no odour, and some bitterish taste.

Prop. & Comp. Besides woody fibre, &c., the capsules contain a small amount of the principles found in opium; and the seeds, called maw seeds, have much bland oil (poppy-oil), but no narcotic properties. When gathered unripe, more opium is present in the capsules.

Off. Prep. Decoctum Papaveris, Lond. Decoction of Poppy-heads. (Poppy-heads bruised ℥iv; distilled water Oiv; boil for fifteen minutes, and strain.)

Extractum Papaveris, Lond. Extract of Poppy. (Poppy capsules bruised, the seeds being removed, ℥xv; boiling distilled water, a gallon. Macerate for twenty-four hours, then boil down to four pints, and gently strain the liquor while hot; lastly, evaporate to a proper consistence.)

Syrupus Papaveris, Lond. Syrup of Poppy. (Poppies bruised, the seeds being removed, ℔iij; sugar, ℔v; boiling distilled water, 5 gallons; rectified spirit, f.℥v. Boil down the water with the capsules to 2 gallons, and press strongly. Again boil down the strained liquor to four pints, and strain while hot; set it aside for twelve hours, that the dregs may subside; then boil down the clear liquor to 2 pints, and dissolve the sugar in it. Lastly, mix the spirit with it.)

Therapeutics. The same as opium, but much weaker; they might well be described as of uncertain strength. The decoction is employed as an external application to allay pain and soothe.

Dose. Of the extract, gr. ij to gr. x; of the syrup, f.ʒj to f.℥ß; for children, f.ʒß, cautiously increased, these patients being so susceptible of the influence of opium.

Opium (Turcicum) *Lond.* Turkey Opium. The juice from the incised unripe fruit of Papaver somniferum, hardened in the air.

Morphiæ Acetas *Lond.* A crystalline salt, prepared from opium.

Morphiæ Hydrochloras *Lond.* A crystalline salt, prepared from opium.

Description. Opium is prepared by making horizontal incisions with a sharp instrument, into the capsules, a few days after the petals have fallen, taking care not to penetrate the interior; a milky juice exudes, which soon becomes brown, and forms tears; these, when scraped off, and wrought together into masses or cakes, form opium: it is usually enveloped with some leaf.

Of *Turkey opium* there are two varieties, viz., Smyrna and Constantinople. *Smyrna* opium occurs in masses more or less flattened, from ½ to 2lbs. in weight, externally covered with the capsules of a species of rumex; internally, soft, of a rich brown colour, heavy narcotic odour and bitter taste, composed of agglutinated tears. *Constantinople* opium, in small lenticular masses, from ¼ to ½lb. often enclosed in a poppy leaf, and marked with the midrib; generally inferior to the Smyrna variety.

Besides Turkey opium, there are several other kinds: *Egyptian* opium, in flat cakes, more or less circular, and about two or three inches in diameter, covered with some leaf (perhaps the poppy); internally hard, of a dark reddish-brown colour, and a musty narcotic odour; it is met with in English commerce, but very inferior to Turkey opium.

East Indian opium, in round balls, like twenty-four pound shot, about 4 lbs. in weight; covered with a thick case of poppy leaves, agglutinated; internally rather soft and black; called *Chinese investment* opium; some occur in cakes, called *Malwa*, and *Garden Patna* opium; these are for the most part inferior to Turkey opium, and are not found in English commerce.

Other varieties of opium, such as *Persian*, or Trebizond, in sticks, and *European* opiums, as English, French, and German, are occasionally met with.

Prop. & Comp. Opium is rich in crystalline principles; it contains a peculiar acid, and several alkaloids, and neutral bodies, the most important of which are as follow:—

Meconic Acid (C_{14} H_5 $O_{11}+3HO$), in crystalline, pearly scales; soluble in water; forms insoluble salts, with lime,

baryta, and oxide of lead; strikes blood red with persalts of iron: easily decomposed.

Morphia (C_{34} H_{20} N O_6), an alkaloid in the form of six-sided prisms; soluble in alcohol, and caustic fixed alkaline solutions; not in ether or water; its solutions are reddened by nitric acid; it has the power of liberating iodine, and hence blueing starch, when added to iodic acid; morphia, and its salts, strike blue with persalts of iron; and when the solutions are treated with free chlorine, and excess of ammonia afterwards added, a brown colour is produced, disappearing with excess of chlorine.

Acetate of Morphia (*Morphiæ Acetas*, LOND.), occurs in very fine needles; generally in powder; apt to lose a part of its acid; soluble in water and alcohol. Composition (C_{34} H_{20} NO_6, $\bar{A}$+HO).

Hydrochlorate of Morphia (*Morphiæ Hydrochloras*, LOND.), is procured in plumous acicular crystals; requires about twenty parts of water to dissolve it; soluble in spirit; when pure, both this salt and the acetate are entirely dissipated at a red heat. Composition (C_{34} H_{20} NO_6, H Cl+6 HO).

Codeia (C_{36} H_{21} N O_6), an alkaloid, in rhombic prisms, or octohedral crystals, with 2 eqs. of water; soluble in alcohol and ether, and also in boiling water, but not in alkaline solutions; does not exhibit the tests given above for Morphia; it forms crystallised salts with acids.

Papaverina (C_{40} H_{21} N O_3), an alkaloid in small acicular crystals; the crystals turn blue with oil of vitriol, and the solution gives rise to a very insoluble hydrochlorate when great excess of the acid is added.

Paramorphia or *Thebaia* (C_{25} H_{14} N O_3?), an alkaloid, not soluble in alkalies; does not give the tests of morphia.

Narcotine (C_{48} H_{24} N O_{15}), neutral, in brilliant prisms, insoluble in water and alkalies; soluble in alcohol, ether and acids, with the latter of which it forms acid crystalline salts.

Narceine (C_{28} H_{20} N O_{12}), neutral silky crystals, insoluble in ether.

Pseudo-morphia, a principle said to occur occasionally, but little understood.

Meconine (C_{10} H_5 O_4), neutral, in acicular crystals.

Porphyroxine, crystalline; composition unknown; distinguished by becoming purple when heated with dilute hydrochloric acid.

Besides these crystallisable bodies, opium contains several different *Resins*, as yet but little examined, also gummy, extractive, and fatty matters, caoutchouc, a trace of *volatile oil*, and inorganic salts. An analysis of Smyrna opium, by

Schindler, gave the following per-centage of constituents; Morphia, 10·50; Codeia, 0·25; Narcotine, 1·30; Narceine, 0·71; Meconine, 0·08; Meconic acid, 4·7; Resin, 10·93; Bassorine, caoutchouc, fat and lignin, 26·25; salts and volatile oil, 3·60; earthy salts, &c., 0·71; brown acid, gum and loss, 41·17.

Off. Prep. Of Opium. CONFECTIO OPII, LOND. Confection of Opium. (Powdered opium ʒvj.; long pepper ℥j; bruised ginger ℥ij; carraway ℥iij; powdered tragacanth ʒij; syrup, f.℥xvj. Rub the dry ingredients together to a very fine powder, and keep in a closed vessel, and as often as the confection is to be used, add by degrees the syrup, made hot, to the powder, and mix.)

EMPLASTRUM OPII, LOND. Plaster of Opium. (Extract of opium ℥j; plaster of lead ℥viij; prepared frankincense ℥ij; boiling water, f.℥j. To the liquefied frankincense add the plaster, melted over a slow fire, and the extract previously mixed with the water, stirring constantly; evaporate slowly to a proper consistence.)

ENEMA OPII, LOND. Enema of Opium. (Decoction of starch, f. ℥iv; tincture of opium, ♏xxx. Mix.)

EXTRACTUM OPII, LOND. Extract of Opium. (Pounded opium, ℔iß; distilled water, Ov. Add 2½ pints of water gradually to the opium, and macerate for 24 hours, frequently stirring with a spatula; then strain. Macerate what remains in the rest of the water for 24 hours, and strain. Lastly, evaporate the strained liquor to a proper consistence.)

LINIMENTUM OPII, LOND. Liniment of Opium. (Tincture of opium, f.℥ij; liniment of soap, f.℥vj. Mix.)

PULVIS CRETÆ COMPOSITUS CUM OPIO, LOND. (See Preparations of Chalk.)

TINCTURA OPII, LOND. Tincture of Opium. (Powdered opium ℥iij; proof spirit Oij. Macerate for seven days, then press and strain.)

VINUM OPII, LOND. Wine of Opium. (Extract of opium ℥ijß; cinnamon bruised, cloves bruised, each, ʒijß; sherry wine, Oij. Macerate for seven days, and strain.)

UNGUENTUM OPII, LOND. Ointment of Opium. (Powdered opium ℈j; lard ℥j. Rub them together.)

Opium forms the main ingredient in Pil. Saponis C. and Pil. Styracis C.; and an important one in Pil. Ipecacuanhæ cum Scillâ; Pulv. Ipecac. C.; Pulv. Kino. C.; Tinct. Camphoræ C.; and Ung. Gall. C.

Of Morphia. LIQUOR MORPHIÆ ACETATIS, LOND. Solution of Acetate of Morphia. (Acetate of morphia, ʒiv; acetic acid, ♏xv; distilled water Oj.; proof spirit Oß. Mix, and dissolve.)

LIQUOR MORPHIÆ HYDROCHLORATIS, LOND. Solution of Hydro-

chlorate of Morphia. (Hydrochlorate of morphia, ʒiv; distilled water, Oj; proof spirit, Oß. Mix, and dissolve.)

Therapeutics. Opium when taken internally, in small doses, produces, at first, some excitement of the vascular and nervous systems, shown by increased fullness and rapidity of pulse, exaltation of the mental functions, and very pleasant sensations; these after a time are followed by a feeling of drowsiness and at last by sound sleep, often accompanied with perspiration; on awakening, the individual usually feels some nausea and headache, the tongue is furred, there is loss of appetite, thirst, and a torpid state of the bowels. If pain or spasm be present, these symptoms become relieved, at the same time the influence of the drug in producing sleep is much diminished. The stimulant effect of opium does not last long, usually not more than half an hour, and when the dose is large and the patient unaccustomed to the drug, it is often scarcely noticed, the soporific influence being very speedily produced; certain conditions of the system and the previous long-continued use of the medicine hinder or prevent the soporific effect, but favour the development of the symptoms of excitement; when large doses are taken the sleepiness becomes intense, and there is great difficulty in awakening the patient; in still larger doses poisonous symptoms ensue, the sleep passing into a condition of stupor or coma, with gradually increasing slowness of respiration, feebleness of pulse, cold perspiration, contracted pupils, followed by death.

The influence of opium upon the different organs and functions of the body may be thus enumerated.

On the *Digestive Organs;* it impairs appetite and the digestive process, causes thirst, diminishes the secretions from the whole mucous membrane, and induces constipation.

On the *Brain* and *Nervous System* the action of opium is most powerfully exerted, shown by the primary exaltation of the mental faculties and the subsequent sleep and coma; the pupils of the eyes become greatly contracted, even to a point, when the patient is powerfully influenced by the drug; the spine is sometimes affected, and tetanic symptoms occur, especially when opium is given to the lower animals, in whom the cerebral effect is less marked.

On the *Vascular System;* opium acts at first as a stimulant and then as a sedative, probably both effects are induced through the medium of the nervous system; when small doses are frequently repeated the force of the circulation can be kept up for a long time.

On the *Cutaneous System;* opium causes free perspiration,

an effect for which the drug is often prescribed, and which is much increased by combination with ipecacuanha, camphor, &c.

On the *Secreting* and *Excreting Organs*, with the exception of the skin, the effect of opium is to lessen their action; the bile is diminished, seen in the pale-coloured fæces; the urine often becomes scanty, also the saliva and buccal mucus.

On the *Respiratory System* opium produces a sedative effect, diminishing the frequency of the respirations, and hence impairing the oxidation of the blood.

On the *Sexual System* opium acts as a stimulant, especially in males, and has been employed in Eastern countries as an aphrodisiac.

Applied to the skin opium appears to possess some power of allaying pain, and is often added to fomentations. When the cutis is denuded, then opium or morphia salts become absorbed and produce constitutional effects. Applied also to the mucous membrane of the rectum in the form of suppository or enema, not only local but the general symptoms of the drug are produced.

Opium is perhaps more extensively used than any other drug, and of such value is it, that it has been called the "gift of God" to man. It may be employed to allay *pain* and *spasm*, occurring in almost any condition of the system, as in the varieties of neuralgia, colic, during the passage of renal or biliary calculi, in tetanus, and inflammations of various kinds; in short, pain, from whatever cause arising, is usually advantageously allayed by opium.

In *Inflammation* it is given not only to assuage pain and spasm, but to control the disease; opium seems to have some power over the capillary circulation, which is advantageously made use of after depletion; perhaps this may be through the medium of the nervous system; it is very commonly given in such cases, combined with calomel, where it is valuable not only for its influence over the disease, but also from its preventing the mercurial salt from running off by the bowels. Opium is frequently given with tartar emetic, in several forms of inflammation. In inflammation of mucous membranes, opium may or may not be useful; when the air-passages are affected, opium should be cautiously administered; but when the intestinal tube is involved, as in dysentery, its property of checking secretion and allaying irritability is of much value.

In *Fevers* opium may be sometimes used when nervous symptoms, as tremor and watchfulness, occur, attended with deficient power of the vascular system; it should always be given in

small doses, and the effects watched. In intermittent fevers, or agues, opium sometimes suffices for the cure, when given before the time of accession of the cold stage; but there are other remedies which possess greater antiperiodic powers, without the narcotic properties; opium, however, may be occasionally used in these cases with advantage.

In diseases of the *Nervous System*, when attended with increased vascular action, opium is generally injurious; but when there is defective power of the circulation, as in delirium tremens, and allied affections, then the value of this drug becomes very evident.

In *Hæmorrhages*, opium is often useful, especially when there has been much loss of blood, and consequent arterial excitement; whether the drug has any direct astringent power over the vascular system is doubtful; it is usually combined in such cases with acetate of lead, and gallic acid.

In *Mucous Discharges*, opium is often of service, especially in diarrhœa; sometimes also in leucorrhœa, &c.; but the condition of the system must be the guide to the administration of the drug in these cases, as also in certain forms of ulcers, which when of a phagedenic kind, or occurring in very weak subjects, are greatly improved by the influence of this remedy.

In *Urinary Diseases*, to restrain the amount of urine, if excessive, as in diabetes; to allay irritability of the bladder, occurring in many affections of the urinary organs, opium is employed with advantage.

In *Chest Affections*, this drug should be used with caution; it often allays the cough; but when the respiratory function is seriously impaired, increased dyspnœa is sometimes produced by it; opium tends to diminish the expectoration, an effect at times desirable, often injurious.

Opium is used in the form of suppository in painful diseases of the rectum and bladder, and chordee; also as an enema in similar cases. It may be applied to the skin in the form of fomentation, over painfully inflamed joints and other parts; and as a liniment or plaster in neuralgic, rheumatic, or other diseases.

Circumstances influencing the operation of Opium.

Age has great influence; children are much more affected than adults; much more than in proportion to the age; and opium must be given with the greatest care to infants and young subjects.

Certain *individuals* are peculiarly susceptible to the action of opium; and in some, great excitement and restlessness is produced, instead of calmness and sleep.

The presence of *Disease* often gives a resisting power to the influence of this drug, especially when great pain is present.

Custom or habit has perhaps the most marked influence on its action; by gradually increasing the dose, enormous quantities may be taken without any very evident effect being produced; the want of the drug in such cases is, however, most severely felt. The author knew a young man who took ʒj of Smyrna opium night and morning, and frequently, in addition to this, f.℥j to f.℥jſs of laudanum during the day. If the drug be discontinued, and after a time the large dose again taken, poisoning may occur.

Action of Morphia Salts. Morphia appears to possess the anodyne and soporific powers of opium, and gives to the drug most of its valuable properties; at the same time it, as a rule, acts more agreeably, having less tendency to produce headache and nausea; it also is much less stimulant in its operation. Other substances contained in opium must impart to the crude drug some of its power, for although only about 10 per cent. of morphia exists in good opium, yet the alkaloid has not more than four times the strength. The different salts of morphia act in the same manner, when estimated by the amount of the alkaloid contained in them.

Action of the other constituents of Opium.

Codeia is stated to act like morphia; the author questions the statement, having repeatedly found 5 grains of codeia fail to relieve pain (in the case of a patient suffering from a tumour pressing on a nerve), which was always readily subdued by a fourth of a grain of morphia. The therapeutics of codeia require to be investigated.

Narcotine was at one time supposed to be the narcotic principle of opium, but is now known not to be so; it probably acts as a tonic and antiperiodic: the author has given it with this view in half-drachm doses without the production of any narcotic symptoms.

The actions of the other crystalline principles of opium are as yet almost unknown; the resinous matter certainly possesses considerable power, and in one case in which it was administered in rather large doses, giddiness and great contraction of the pupils ensued.

Dose. Of opium, gr. $\frac{1}{4}$ to gr. iij or more;—of extract. opii, gr. $\frac{1}{2}$ to gr. iij or more;—of tinct. opii (laudanum), ♏iv to ♏xl;—of vinum opii, ♏iv to ♏xl;—of confectio opii, gr. x to gr. xl;—of pulv. cretæ comp. cum opio, gr. x to ʒj; —of pil. saponis comp., gr. v. upwards;—of pil. styracis comp.,

gr. v. upwards;—of pulv. ipecac. comp., gr. v. upwards;—of pulv. kino. comp., gr. v upwards;—of tinctura camphoræ comp., f.ʒj to f.ʒij;—of morphiæ acetas, gr. $\frac{1}{8}$ to gr. j;—of morphiæ hydrochloras, gr. $\frac{1}{8}$ to gr. j;—of liquor morphiæ acetatis, ♏viij to f.ʒj;—of liquor morphiæ hydrochloratis, ♏viij to f.ʒj.

Adulteration. Opium often contains many mechanical impurities, as stones, sand, clay, bullets, &c.; it may also be mixed with vegetable extracts of various kinds, sugar and treacle; it may contain much water, and it may have had much of its active matter extracted by water, and subsequently dried; physical examination will throw much light on the value of the drug, but on account of its very varying quality, processes are employed for ascertaining the amount of morphia contained in it, and this is taken as the index to the commercial value of the drug. Different methods have been devised. The following, which is a modification of Thiboumary's, given by Dr. Pereira, appears to be the most satisfactory. "Prepare an aqueous extract of the amount of opium, dissolve it in water, add ammonia to the boiling liquor (not in much excess), and when cool, filter, wash with water, and afterwards dry; then mix the dried precipitate with a little proof spirit and add acetic acid, drop by drop, until the solution slightly reddens blue litmus. The morphia dissolves, leaving the narcotine; from the filtered solution precipitate the morphia by means of ammonia; collect and dry." Good Smyrna opium should yield 10 per cent. of morphia; Egyptian opium about 6 or 7 per cent.; East Indian from 3 to 8 per cent. or more.

Rhœas *Lond.* The recent petals of Papaver Rhœas, the Red or Corn Poppy; Lin. Syst., Polyandria monogynia; indigenous: growing in fields and waste places.

Description. These petals are of a rich scarlet colour, becoming dull red on drying. They have the peculiar heavy odour of opium.

Prop. & Comp. The petals yield to water *red colouring matter*, for which they are chiefly prized: this colour is blackened by alkalies. They contain, in addition to the red colouring matter, minute traces of the peculiar constituents of opium.

Off. Prep. Syrupus Rhœados, Lond. Syrup of Red Poppy. (Red poppy petals ℔j; boiling distilled water Oj; sugar ℔iij, or as much as may be sufficient; rectified spirit, f. ℥ijß, or as much at may be sufficient. Add the red poppy petals gradually to the water, heated in a water-bath, frequently stirring; then

set the vessel aside, macerate for twelve hours: afterwards press out the liquid with the hand. Strain, and finish the process as directed for syrup of Althæa.)

Therapeutics. The action of red poppy is very slight, but similar to that of opium; the amount of active ingredients is very small, and rather uncertain in quantity. It is chiefly used as a colouring agent.

Dose. Of syrupus rhœados, from ʒj upwards.

CRUCIFERÆ, OR BRASSICACEÆ.

Sinapis *Lond.* The seed of Sinapis nigra and Sinapis alba, or Black and White Mustard, Lin. Syst., Tetradynamia siliquosa; plants common in Europe.

Description. Black mustard seeds are very small, round, wrinkled, and brownish-black on the surface, yellow within; white mustard seeds are larger, and yellow on the surface.

Prop. & Comp. When crushed, both seeds yield the flour of mustard; the best is made from the mixed seeds, and, when dry, has little or no odour. Both contain a *fixed oil,* from 25 to 35 per cent. Black mustard contains no volatile oil, but a principle named *Myronic acid,* and an albuminous matter, *Myrosine,* which yield on the addition of water *volatile oil* of mustard ($C_8 H_5 NS_2$), of a slight yellow colour: sp. gr. about 1·03, very pungent and acrid. White mustard does not yield volatile oil, but contains a crystallisable compound, *sulphosinapisin,* giving rise to an acrid but not volatile principle, containing sulphur. The fixed oil contains *Erucic* acid ($C_{44} H_{41} O_3 + HO$).

Off. Prep. Cataplasma Sinapis, Lond. Mustard Cataplasm. (Boiling water f.℥x; powdered linseed, powdered mustard, of each ℥ijß, or as much as may be necessary. By degrees add the powders, first well mixed, to the water; keep stirring that a cataplasm may be formed.) Too hot water, or alcohol, or vinegar are apt to injure the production of the volatile oil.

Mustard is contained in Inf. Armoraciæ Comp.

Therapeutics. Mustard seeds and flour act as powerful stimulants. Internally, in large doses, mustard causes speedy vomiting (useful in narcotic poisoning); in smaller doses, as a condiment, it assists digestion. The entire seed was formerly used, and now and then caused ill effects, from accumulating in

the intestines. Externally, in the form of *cataplasma sinapis*, it is a powerful rubefacient, useful in slight inflammations, head affections, neuralgic and other pains and spasms.

Dose. As an emetic, from one teaspoonful to a tablespoonful mixed with a little water.

Adulteration. Flour of mustard is extensively mixed with common flour, pepper, chillies, turmeric, &c.

Armoracia *Lond.* Horseradish. The recent root of Cochlearia Armoracia, Lin. Syst., Tetradynamia siliculosa; common throughout Europe.

Description. A long, white, tap-shaped root, familiar to all.

Prop. & Comp. When scraped, it emits a very pungent odour, and has an acrid taste, depending on a *volatile oil* ($C_8 H_5 NS_2$) identical with oil of mustard; probably the oil is formed as in the black mustard seed.

Off. Prep. INFUSUM ARMORACIÆ COMPOSITUS, LOND. Compound Infusion of Horseradish. (Horseradish root sliced, mustard seed bruised, of each ℥j; compound spirit of horseradish f.℥j; boiling distilled water Oj. Macerate the horseradish and mustard seed in the water for two hours in a covered vessel, and strain; then add the spirit.)

SPIRITUS ARMORACIÆ COMPOSITUS, Compound Tincture of Horseradish. (Horseradish sliced, dried orange peel, each ℥xx; bruised nutmeg ʒv; proof spirit, a gallon; water Oij. Mix them; let a gallon distil with a slow fire.)

Therapeutics. The same as mustard; seldom employed in the fresh state except as a condiment. The official preparations are used in atonic dyspepsia; also as sudorifics in chronic rheumatism, &c. As a syrup it has been slowly swallowed in hoarseness.

Dose. Of inf. armoraciæ c., f.℥j to f.℥ij; of tinct. armoraciæ c., f. ʒj to f.ʒiij.

VIOLACEÆ.

Viola *Lond.* The recent petals of Viola odorata, the Sweet Violet; Lin. Syst., Pentandria monogynia; indigenous.

Description. Small petals, having a very agreeable characteristic odour and colour. The root has been used as a medicine.

Prop. & Comp. The infusion, which is not strongly coloured, becomes bright red on the addition of an acid, and green with an alkali, and hence employed as a tint. Besides the above *colouring matter*, the petals contain a *volatile oil* and a little acrid matter, *violine*, which can be separated as a white powder, and somewhat resembling emetina.

Off. Prep. SYRUPUS VIOLÆ, LOND. Syrup of Violet. (Violets ℥ix; boiling distilled water Oj; sugar ℔s. iij, or as much as may be necessary; rectified spirit, f.℥ijß, or as much as necessary. Macerate the violet flowers in water for twelve hours, then press and strain. Set aside that the dregs may subside, and complete the process as directed for syrup of marshmallow.)

Therapeutics. Violets are used in medicine for their colour, and on account of the slight laxative effect of the syrup, which is given to very young children, either alone or mixed with almond oil. The root is purgative, and emetic in half-drachm or drachm doses.

Dose. Of syrupus violæ, ʒß to ʒij.

Adulteration. Sometimes the petals of the scentless species are substituted for those of the sweet violet; of little therapeutic importance.

POLYGALACEÆ.

Senega *Lond.* Seneka; the root of Polygala Senega: Lin. Syst., Diadelphia octandria; a small plant growing in the United States of America.

Description. Rootstock, or knotty head with roots proceeding.

Prop. & Comp. Taste sweetish, and acrid to the fauces; it contains a principle called *senegin* or *polygalic* acid, obtained as a white powder, with some tannin, pectin, gum, &c. The active part of the root is the cortex.

Off. Prep. DECOCTUM SENEGÆ, LOND. Decoction of Senega. (Senega ʒx; distilled water Oij. Boil down to a pint, and strain.) Water extracts the senegin; also the pectin, gum, &c.

Therapeutics. Senega root is a stimulant to the mucous membranes and skin, acting especially on the bronchial tubes. It is chiefly employed in asthenic and chronic bronchitis; also in dysmenorrhœa and albuminuria: often combined with sesquicarbonate of ammonia, and other expectorants and diuretics.

Dose. Of the powder ℈j to ʒj: of decoct. senegæ ℥j to f.℥ij.

Adulteration. Ginseng, or root of Panax quinquefolium; also Gillenia, detected by absence of the line running along the true seneka root.

Krameria *Lond.* Rhatany Root; the root of Krameria triandra. Lin. Syst., Tetrandria monogynia; growing in Peru and Chili.

Description. Generally a large root-stock, with long roots from $\frac{1}{8}$ to $\frac{1}{2}$ inch thick proceeding from it. Externally, dark red or reddish brown; internally, paler red. The powder is red.

Prop. & Comp. Rhatany has no odour, but a sweetish astringent taste, tinging the saliva very red. It contains *krameric acid*, of which little is known, about 40 per cent. of *tannin*, and a red astringent matter. These are all soluble in water and alcohol.

Off. Prep. Infusum Krameriæ, Lond. Infusion of Rhatany. (Rhatany ℥j; boiling distilled water Oj. Macerate for an hour in a closed vessel, and strain.)

Therapeutics. A powerful astringent; may be used whenever tannin is indicated. The powder has had much repute as a dentifrice when the gums are bleeding or spongy. It may also be employed as a gargle or injection in relaxed sore throat, leucorrhœa, prolapsus ani, in the form of infusion.

Dose. Of the powder, ℈j to ℈ij; of inf. krameriæ, f.ʒj to f.ʒij.

LINACEÆ.

Lini Semen *Lond.* The seed of Linum usitatissimum; common Linseed or Flax; Lin. Syst., Pentandria pentagynia: an indigenous plant.

Lini Oleum, *Lond.* Linseed Oil.

Description. A small oval, oblong, flattened seed, pointed at one end; dark brown and shining on the surface, and white within. The oil, which is obtained by simple expression, is of a light yellow colour, similar in appearance to most other vegetable oils.

Prop. & Comp. The seeds contain a *fixed oil*, about 20 per cent., and *mucilage*, together with the ordinary constituents of seeds: the oil is found in the kernel, the mucilage in the envelope

or testa of the seed. After the expression of the oil, the marc which remains is called linseed or oil-cake; and when powdered, linseed meal. The fixed oil, sp. gr. 0·930, rapidly absorbs oxygen from air and forms a varnish, hence called a drying oil; it contains *oleine* and *margarine*. The oleic acid from linseed oil differs somewhat from ordinary oleic acid.

Off. Prep. CATAPLASMA LINI, LOND. Linseed Cataplasm. (Boiling water, f.℥x; powdered linseed ℥ivß, or as much as may be necessary. Stir constantly, adding the linseed by degrees to the water, to form a cataplasm.)

INFUSUM LINI COMPOSITUM, LOND. Compound Infusion of Linseed. (Linseed ʒvj; fresh liquorice, sliced, ʒij; boiling distilled water Oj. Macerate for four hours near to the fire in a closed vessel, and strain.)

Therapeutics. Internally, when given in the form of a simple infusion (linseed tea), or the compound infusion of the Pharmacopœia, linseed is demulcent from the mucilage and a little oil contained in it, and has been employed in catarrhal and urinary affections; also in diarrhœa and dysentery. Externally, linseed powder is used as a poultice to inflamed and suppurating parts. The oil is a useful emollient to burns or scalds, either alone or mixed with lime-water, and the linimentum calcis, Edin., is made with it in place of olive oil.

Dose. The infusions may be taken *ad libitum.*

LINUM CATHARTICUM, or Purging Flax, is contained in the Edinburgh Pharmacopœia. The dried plant is used made into infusion, and given in about ʒß doses: it has no particular value as a purgative.

MALVACEÆ.

Althæa *Lond.* The root of Althæa Officinalis, or Marshmallow; Lin. Syst., Monodelphia polyandria; growing throughout Europe.

Description. Small cylindrical pieces, about the size of a finger, yellowish white externally, white within; the epidermis is generally removed.

Prop. & Comp. Little odour, taste sweet and mucilaginous; it contains much *mucilage*, some starch and sugar, also *altheine* ($C_8\ H_8\ N_2\ O_5$), identical with asparagine.

Off. Prep. SYRUPUS ALTHÆÆ, Syrup of Marshmallow. (Marshmallow, sliced, ℥jß; sugar, ℔iij, or as much as may be

necessary; distilled water, Oj; rectified spirit, ℥ijß, or as much as may be necessary. Macerate the marshmallow in the water for 12 hours, press out the liquor, and strain through linen: then add of sugar twice the weight of the strained liquid, and dissolve with a gentle heat. Lastly, when the syrup has cooled, mix to each fluid ounce half a fluid drachm of spirit.)

Therapeutics. Simply a demulcent, used to allay cough, as other mucilages; much used in France, under the name Guimauve, in lozenges, &c.

Dose. Of a decoction, *ad libitum;* of the syrup, f.ʒj to f.℥j.

Besides the althæa, other malvaceous plants are used for the mucilage they contain, as the *malva sylvestris,* or common mallow, and the *malva rosea,* or hollyhock.

Gossypium *Edin.* Cotton. A filamentous substance attached to the seeds of gossypium herbaceum and other species of this genus; Lin. Syst., Monodelphia polyandria.

Description. Cotton consists of fine filaments or tubular hairs, becoming flattened by drying, which were attached to the seed-coat; these tubes have but few joints when examined by the microscope: cotton can be distinguished from linen by the fibres on the latter having tapering ends, and being aggregated in bundles. In composition it resembles lignin, or ordinary woody fibre ($C_{12}\ H_{10}\ O_{10}$).

Off. Prep. Collodion, *U. S.* (Made by heating cotton or paper with a mixture of nitre and sulphuric acid: nitric acid is formed, which, acting on the lignin, forms a nitrogenised compound xyloidine; this, dissolved in ether, forms collodion.)

Use. Cotton is used as an application to burns and scalds, diminishing the inflammation, and aiding the recovery, probably from protecting the surface: occasionally employed in erysipelas.

Collodion, when applied to the skin, leaves, on the evaporation of the ether, a thin transparent layer, and may be used to cut and inflamed surfaces, in skin diseases, and chapped nipples, to arrest hæmorrhage from leech-bites, &c.: in some of these cases it acts by forming a protecting surface; in others by the contraction of the film constricting the vessels of the part.

AURANTIACEÆ.

Aurantii Cortex *Lond.* Orange-peel. The exterior rind of the fruit of Citrus Bigaradia, the Seville or bitter orange tree; Lin. Syst., Polyadelphia polyandria; growing in Southern Europe, Spain, &c.

Aurantii Floris Aqua *Lond.* Orange-flower water. Water distilled from the flower of Citrus Bigaradia, and Citrus Aurantium, the sweet orange tree.

Description. The cortex, or rind, is well known; the interior white portion should be removed, and it is ordered in the London Pharmacopœia to be dried in the months of February, March, or April.

Prop. & Comp. Aqua Floris Aurantii has the grateful odour of the orange blossoms. The cortex or rind contains a *volatile oil* (C_{10} H_8), a *bitter extractive*, and a little *gallic acid*. Aqua Floris Aurantii contains a little *volatile oil* differing from that contained in the cortex.

Off. Prep. (of the rind). CONFECTIO AURANTII, LOND. Orange Confection. (Fresh orange rind, rasped, ℔j; sugar, ℔iij. Bruise the rind in a stone mortar with a wooden pestle; add the sugar, and again beat them together until thoroughly mixed.)

INFUSUM AURANTII COMPOSITUM, LOND. Compound Infusion of Orange Peel. (Dried orange peel, ℥ß; lemon peel, ʒij; bruised cloves, ʒj; boiling distilled water, Oj. Macerate for fifteen minutes in a close vessel, and strain.)

SYRUPUS AURANTII, LOND. Syrup of Orange Peel. (Dried orange peel, ℥ijß; boiling distilled water, Oj; sugar, ℔iij, or as much as may be necessary; rectified spirit, f.℥ijß, or as much as necessary. Macerate the rind for twelve hours in a closed vessel; press out the liquor, and boil for ten minutes; strain, and complete the process as directed for syrup of marshmallow.)

TINCTURA AURANTII COMPOSITA, Tincture of Orange Peel. (Dried orange rind, ℥iijß; proof spirit, Oij. Macerate for seven days; press, and strain.)

Orange peel is contained in some other official preparations.

Therapeutics. The rind is an aromatic bitter stomachic, a pleasant adjunct to other bitters in the treatment of dyspepsia;

it covers, to some extent, the taste of quinine. Aqua Floris Aurantii is only used as a vehicle for other medicines.

Adulteration. Orange-flower water may contain lead derived from the vessels in which it is imported; this can be detected by passing sulphuretted hydrogen through it, and when free from metallic *impurity* it is not discoloured.

Limonum Cortex *Lond.* Lemon Peel. The fresh and dry rind of the fruit of Citrus Limonum, the Lemon tree; Lin. Syst., Polyadelphia polyandria; a tree cultivated in Southern Europe.

Limonum Oleum *Lond.* Oil of Lemons. A volatile oil expressed from the rind of the fruit.

Limonum Succus *Lond.* Lemon Juice.

Description. The *rind,* familiar to all, should have the interior white portion removed and dried in the months of April and May.

The *volatile oil* is usually obtained by rasping the outer portion of the rind, and pressing it in hair sacks, sometimes by distillation; it is of a pale yellow colour, with the odour and taste of the peel: the purer oil is obtained by distillation.

The *juice,* made by pressing the fruit and straining, forms a slightly turbid, almost colourless mucilaginous acid liquid.

Prop. & Comp. The rind contains the *volatile oil*, a *bitter extractive* and a little *gallic acid;* also a principle *Hesperidine,* which crystallises in fine white needles.

The volatile oil, *Limonum Oleum,* sp. gr. 0·85, consists of two isomeric oils (as is the case with most volatile oils). Composition (C_{10} H_8.)

The juice, *Limonum Succus,* contains *citric acid* (C_{12} H_5 O_{11} + 3 HO) described under acids, in the inorganic department, and *mucilage,* with small quantities of malic acid, and acid salts, especially those of *potash.*

Off. Prep. Syrupus Limonum, Lond. Syrup of Lemons. (Lemon juice, strained, Oj; sugar ℔.ijß; rectified spirit ℥ijß. Boil the juice for ten minutes, and strain; to this add the sugar, and dissolve it. Lastly, when the syrup has cooled, mix in the spirit.)

Tinctura Limonum, Lond. Tincture of Lemons. (Fresh rind of lemons ℥iijß; proof spirit Oij. Macerate for seven days, then press and strain.)

The rind is contained also in Infusum Aurantii Comp. and Infusum Gentianæ Comp.

Therapeutics. The peel is an aromatic stomachic; the volatile oil a stimulant and carminative when given internally, and stimulant and rubefacient externally applied; the juice is refrigerant, resembling a solution of citric acid, and may be used for making effervescing draughts, in lieu of that acid. It possesses some powers besides, which render it antiscorbutic, which citric acid certainly is not; the author attributes this power to the potash salts contained in it. Dr. G. O. Rees has proposed it as a remedy in rheumatism.

Dose Of the syrup, ʒj. to ʒss or more; of the tincture, f.ʒj to f.ʒij; of the oil, ♏j to ♏v; of the juice, ʒss to ℥iv.

Adulteration. Oleum Limonum is liable to admixture with oil of turpentine, difficult to detect except when in large quantities. Lemon juice is frequently mixed with lime juice, which has the same properties; and that used in the navy has a tenth part of brandy added to it to prevent decomposition. Lemon juice has often substituted for it a mixture of sugar and water, acidulated with sulphuric acid.

Indian Bael, or Bela, a drug much used in India, has been recently introduced into this country; the part employed is the dried rind of the unripe fruit, which resembles that of the pomegranate; the plant is named the Ægle Marmelos, and belongs to the order Aurantiaceæ. The rind contains *tannin* and some *aromatic volatile oil*, and has obtained considerable reputation in India in the treatment of diarrhœa and dysentery; from the author's limited experience of its powers in diarrhœa, he is not disposed to consider it superior to other vegetable astringents. The fruit, when ripe, yields a pulp which can be made into jelly, and acts as a mild aperient.

GUTTIFERÆ.

Cambogia *Lond.* Gamboge. The gum resin from uncertain species of Garciniæ. The Ceylon variety from Hebradendron gambogioides; Lin. Syst., Monœcia monodelphia; inhabiting Siam, Ceylon, &c.

Description. The Siam gamboge occurs in pipes or cylinders, externally streaked from the impression of the bamboo reeds, in which the juice is collected; the pipes are from ½ in. to 1½ in. or more in diameter. Gamboge is hard, brittle, with a vitreous

fracture, of a bright yellow colour: inferior varieties, in fragments and masses, also come from Siam; and a coarse kind is made at Ceylon.

Prop. & Comp. No odour, taste slight at first, afterwards acrid, easily powdered. It consists of about 70 per cent. of resin *gambogic acid* (C_{40} H_{23} O_8), with gum, &c.; when good, there is no starch; rubbed with water, the gum dissolves, the remainder is the suspended resin, forming a yellow emulsion. The resin dissolves in alcohol, but is again precipitated by water.

Off. Prep. PILULA CAMBOGIÆ COMPOSITA, LOND. Compound Gamboge Pill. (Gamboge, powdered, ℈ij; powdered socotrine or hepatic aloes ℈iij; powdered ginger ℈j; soft soap ℥ß. Mix the powders; the soap being added, beat all together to form a mass.)

Therapeutics. Gamboge acts as a drastic and hydragogue purgative, often causing vomiting. It is seldom given alone, but combined with cream of tartar or calomel, it may be used in dropsies; and with aloes and aromatics, as an ordinary brisk purgative; sometimes as a vermifuge.

Dose. Of the powder, gr.j to gr.v; of pil. gambogiæ c., gr. v to gr.xv.

CANELLACEÆ.

Canella *Lond.* The Bark of Canella alba or Laurel-leaved Canella, Lin. Syst., Dodecandria monogynia; growing in the West Indies.

Description. The bark occurs in large quills or flattened pieces about an inch or so in diameter, and of varying length; externally, of a pinkish white colour; internally, very white: it breaks with a starchy fracture.

Prop. & Comp. Odour spicy; taste warm and bitter. It contains a *resin*, a little *volatile oil*, and *bitter extractive*, besides starch and *mannite* sugar; no tannic, gallic, or sulphuric acids are present.

Off. Prep. No preparation with its name attached; but it is an ingredient in Vinum Aloes. In the United States Pharmacopœia, a compound powder of aloes and canella is still retained under the old name of *Hiera Picra*.

Therapeutics. An aromatic bitter stomachic and tonic; it may be given in cases of atonic dyspepsia.

Dose. Of the powder, gr. xv to ℈ß.

Adulteration. Canella is not itself adulterated, but has been substituted for Winter's bark: for the distinguishing characters, see Winter's Bark.

VITACEÆ.

Uva *Lond.* The raisin, the prepared fruit of Vitis Vinifera, or the Grape Vine; Lin. Syst., Pentandria monogynia; probably a native of Persia, cultivated extensively in different parts of Europe.

Prop. & Comp. Raisins contain a considerable amount of *grape sugar* ($C_{12}\ H_{14}\ O_{14}$), and *bitartrate of potash;* it is from the grape that tartaric acid is derived, being obtained from argol, the deposit on the sides of wine-casks.

Off. Prep. Raisins are contained in Decoctum Hordei C., Tinct. Cardamomi C., and Tinct. Sennæ, C.

Therapeutics. Slightly refrigerant, but never used in medicine for any therapeutic property they possess. Used to sweeten preparations.

Vinum Xericum *Lond.* Sherry Wine, described under the head of Alcoholic preparations, is obtained by fermenting the juice of some species of grape.

ZYGOPHYLLACEÆ.

Guaiaci Lignum *Lond.* The Wood of Guaiacum Officinale, the Official Guaiacum tree; Lin. Syst., Decandria monogynia; growing in the West Indies and the warmer parts of South America.

Guaiacum *Lond.* Guaiacum resin, prepared from the wood by means of heat; it exudes also spontaneously, concretes and forms tear guaiacum.

Description. Guaiacum wood is met with in large logs, and known by the name of *Lignum Vitæ,* generally denuded of bark, consisting of the duramen or heart-wood of a dark greenish-brown colour, and the alburnum of a yellow tint; it is very hard, tough, and heavy; sp. gr. 1·33; the heart-wood contains

a large amount of the guaiacum resin, which is dark brown, transparent in very thin layers, brittle, of aromatic odour, and leaving, when tasted, a peculiar burning sensation in the throat; the tears are oval, of varying size, and often covered with a greenish powder on the surface. The *resin* is usually procured by boring a longitudinal hole in the log, and putting one end of it into the fire, the resin melts and exudes at the other end, where it is collected. The *wood* is commonly sold in chips or raspings for medicinal purposes; these when boiled in salt water yield the resin, which rises to the surface.

Prop. & Comp. The most important constituent of the wood is the above-described *resin*, which has a sp. gr. 1·29, is insoluble in water, or yields to that fluid only some extractive matter mixed with it; soluble in alcohol and ether, also in alkaline solutions; precipitated from alcohol by water, and from alkalies by acids; acted on by nitric acid and chlorine, when the colour is first shaded green, then blue, at last brown. The resin, called guaiacic acid, has the composition $(C_{40} H_{23} O_{10})$.

Off. Prep. Mistura Guaiaci, Lond. Mixture of Guaiacum. (Powdered guaiacum ʒiij; sugar ℥ß; powdered acacia ʒij; cinnamon water, Oj. Rub the sugar with the guaiacum and acacia; to these, while rubbing, add gradually the cinnamon water.)

Tinctura Guaiaci Composita, Lond. Compound Tincture of Guaiacum. (Guaiacum, coarsely powdered, ℥vij; aromatic spirit of ammonia, Oij. Macerate for seven days, and strain.)

A simple tincture made with rectified spirit is contained in the Edinburgh and Dublin Pharmacopœias. Guaiacum wood forms an ingredient of the *compound decoction of sarsaparilla*, the *compound powder of aloes*, and *compound calomel pill* of the London Pharmacopœia.

Therapeutics. Guaiacum, either in the form of the wood or resin, when taken internally, is apt to cause heat in the throat, irritation of the intestinal canal, and, in large doses, purging. When absorbed it acts as a stimulant, diaphoretic and alterative, and is by some considered to be emmenagogue. It is employed in chronic forms of rheumatism, especially that variety called cold rheumatism, in which the symptoms are relieved by warmth; also in periosteal affections connected with a syphilitic taint, and other chronic affections, as gout, skin diseases, and dysmenorrhœa.

Dose. Of guaiac. resin, gr. x to ʒß; of mistura guaiaci, f. ℥j to f. ℥jß; of tinctura guaiaci comp., f. ʒß to f. ʒjß.

Adulteration. Other resins, as that from the coniferous trees, detected by the terebinthinate odour, and solubility in oil of turpentine. A simple tincture of guaiacum, when thrown into water, becomes milky, from the precipitation of the resin: if a solution of potash is now carefully added, it is cleared, and remains so after excess of the alkali, provided guaiacum only be present, but not if other resins are contained in the tincture. Guaiac resin is turned blue by gluten, but not by starch.

RUTACEÆ.

Ruta *Lond.* The leaf of Ruta graveolens, or Common Rue; Lin. Syst., Decandria monogynia; a plant growing throughout Europe.

Rutæ Oleum *Lond.* Oil of Rue. Distilled from the flowering plant.

Description. The leaves are supra-decompound, the leaflets oblong and ovate, glaucous green, fleshy, and dotted. The oil is of a greenish-yellow colour, sp. gr. about 0·837.

Prop. & Comp. The leaves owe their properties chiefly to the *volatile oil* ($C_{20} H_{14} O_3$), which has a strong, disagreeable odour, and acid taste; becomes brown by keeping; besides which they contain a *bitter extractive* matter, soluble in water.

Off. Prep. Confectio Rutæ, Lond. Confection of Rue. (Fresh rue, bruised, carraway, bayberries, each ℥jß; prepared sagapenum, ℥ß; black pepper, ʒij; honey, ℥xvj; distilled water, as much as may be necessary. Rub the dry ingredients together to a very fine powder; dissolve the sagapenum and honey in the water, over a slow fire. Gradually add the powder, and mix all together.)

Therapeutics. Rue, or its oil, acts as a powerful topical stimulant, and has been used in flatulent colic; it also appears to be an antispasmodic and emmenagogue, and seems useful in hysterical affections, and in epilepsy; by some it has been thought anthelmintic. Externally it may be used as a rubifacient. Sometimes employed in the form of enema.

Dose. Of the powdered leaves, ℈j to ℈ij; of oleum rutæ, ♏ij to ♏vj; of confectio rutæ, ʒß to ʒj.

Buchu *Lond.* The leaf of Barosma Serratifolia, Barosma Crenulata, and Barosma Crenata; Lin. Syst., Pentandria; monogynia; plants growing at the Cape of Good Hope.

Description. These leaves, of the various species, are linear, lanceolate, ovate, and obovate in shape, crenated or serrated; thick, coriaceous, dotted with oil glands, of a pale yellow or greenish colour, and powerful agreeable odour; smooth on the upper surface.

Prop. & Comp. Buchu leaves contain a *volatile oil,* which gives the odour, &c., and a *bitter extractive* matter, soluble in water.

Off. Prep. INFUSUM BUCHU, LOND. Infusion of Buchu. (Buchu leaves, ℥j; boiling distilled water, Oj. Macerate for four hours in a covered vessel, and strain.)

A tincture is contained in the Edinburgh and Dublin Pharmacopœias.

Therapeutics. Buchu seems to be a slight tonic and stomachic, but is used chiefly on account of its action on the urinary organs, in chronic catarrh of the bladder, and irritable condition of these parts; it acts, also, as a diuretic, and occasionally as a diaphoretic.

Dose. Of the powder, ℈j to ℈ij; of infusum buchu, f.℥j to f.℥ij; of the tincture, ʒj to ʒij.

Cusparia *Lond.* The bark of Galipea Cusparia, Angostura bark tree, or of Galipœia officinalis; Lin. Syst., Pentandria monogynia; growing in South America.

Description. In curved pieces, or quills, several inches in length, about an inch or rather more in breadth, and one-eighth of an inch thick; the edges are feathered. Externally it is covered with a yellowish grey, uneven epidermis; internally, light brown, and separable into thin layers. It breaks with a resinous fracture; has a rather peculiar odour, and very bitter, but aromatic taste.

Prop. & Comp. Cusparia bark contains a trace of *volatile oil,* some *resin,* and a principle *cusparine,* in tetrahedral crystals, soluble in alcohol, acids, and alkalies; composition unknown. The infusion of cusparia is precipitated by tannin, so also is cusparine.

Off. Prep. INFUSUM CUSPARIÆ, LOND. Infusion of Cusparia. (Cusparia bark, bruised, ʒv; boiling distilled water Oj. Macerate for two hours in a closed vessel, and strain.)

TINCTURA CASPARIÆ, EDIN. Tincture of Cusparia. (Cusparia, in moderately fine powder, ℥ivß; proof spirit Oij. Prepare by maceration or percolation.)

Therapeutics. An aromatic stomachic, and probably has antiperiodic properties. Used in atonic dyspepsia, diarrhœa, and dysentery, also in convalescence from acute diseases. In South America it has been much employed in the treatment of low malignant fevers, occurring in marshy districts; it is not much prescribed in England, nor have its powers been fully investigated.

Dose. Of the powdered bark, gr. x to ʒß; of infusum cuspariæ, f.℥j to f.℥ij; of tinctura cuspariæ, f.ʒß to f.ʒij.

Adulteration. The bark of strychnos nux vomica has been substituted for true cusparia or Angostura bark, and hence named false Angostura bark; as this substitution has been the cause of fatal accidents, the knowledge of the distinction between the two becomes important. The false bark is usually in shorter pieces, more irregularly twisted, with little or no odour, and much more bitter than the true bark; it breaks with a shorter and more resinous fracture, and is not separable into layers, the epidermis is whitish but spotted red; nitric acid turns the inner surface blood-red, the epidermis greenish or black; true cusparia is, however, reddened by nitric acid, when applied to the inner surface. False cusparia bark yields *brucia* and *strychnia;* the true bark contains neither of these alkaloids.

SIMARUBACEÆ.

Quassia *Lond.* Quassia: the Wood of Picræna excelsa; Lin. Syst., Polygamia monœcia. This forms Jamaica Quassia. The wood of Quassia Amara was formerly imported as Surinam Quassia, not met with at present in English commerce.

Description. Quassia occurs in cylindrical logs or billets of varying size, externally greyish brown, internally light yellow. The wood is tough, without odour, but intensely bitter: it is generally sold in chips.

Prop. & Comp. It yields its bitterness to water and spirit; contains a crystallisable neutral principle, *quassine* ($C_{20}H_{12}O_6$), which possesses the bitterness of the wood; it is devoid of tannin or gallic acid.

Off. Prep. INFUSUM QUASSIÆ, LOND. Infusion of Quassia.

(Quassia, sliced, ℈ij; boiling distilled water Oj. Macerate for two hours in a closed vessel, and strain.)

In the Edinburgh Pharmacopœia a watery extract, and also a simple and compound tincture, are contained.

Therapeutics. Quassia acts as a pure bitter stomachic, devoid of astringency: used in atonic indigestion, such as occurs in gout, from alcoholic abuse and other causes. It is sometimes given as a tonic after acute diseases, and has been employed as an antiperiodic in fevers. It probably acts on the nervous system in large doses.

Dose. Of the powder, gr. xv to ʒß; of infusum quassiæ, f.℥j to f.℥ij; of the extract, gr. iij to gr. v; tinctures, f.ʒj to f.ʒij.

Simaruba *Edin. Dub.* The bark of the root of Simaruba Amara, or the Mountain Damson; Lin. Syst., Diœcia decandria; a plant growing in the West Indies.

Description. It occurs in tough fibrous pieces, several feet in length, and folded; pale in colour, epidermis darker and rough: of very bitter taste.

Prop. & Comp. Resembles quassia in containing *quassine*; it also contains a little gallic acid and much mucilage.

Off. Prep. Infusum Simarubæ, Edin. Infusion of Simaruba. (Simaruba ʒiij; water Oj.) The Dublin infusion is stronger.

Therapeutics. It may be used in the same cases as quassia: it gained at one time some repute in the treatment of diarrhœa and dysentery.

Dose. Of the powders, gr. xv to ʒß; of the infusion, f.℥j to f.℥ij.

Cedron. The seeds of Simaba Cedron, a plant belonging to this order, have been used as a medicine in France. They are concavo-convex in shape, about 1 inch long, $\frac{3}{4}$ in. broad, and $\frac{1}{2}$ in. thick; of a light yellowish colour; an intense bitter taste, probably due to *quassine*. The seeds have been supposed to be an antidote to the poison of serpents: probably they would be found to be a very useful tonic and stomachic, similar to quassia and simaruba.

SUB-CLASS II. CALYCIFLORÆ.

RHAMNACEÆ.

Rhamni Succus *Lond.* Buckthorn Juice. The juice of the fruit of Rhamnus Catharticus, Lin. Syst., Pentandria monogynia; indigenous.

Description. The berries, the juice of which is officinal, are, when ripe, about the size of a pea, black, smooth, and containing four seeds, and a green juicy parenchyma; the odour of the rhamnus is somewhat nauseous.

Prop. & Comp. The juice has the same odour and is of the same colour as the parenchyma; it becomes of a bright green colour on the addition of lime-water or an alkali; evaporated to dryness with lime-water it forms sap green. It contains sugar, mucilage, and a crystallisable principle called *rhamnine,* also a principle possessing purgative properties, but it is not certain whether this is identical with the aforesaid Rhamnine.

Off. Prep. SYRUPUS RHAMNI, LOND. Syrup of Buckthorn. (Juice of buckthorn, Oiv; ginger sliced, pimento bruised, each, ℨvj; sugar, ℔vj; rectified spirit, f.℥vj. Set aside the juice for three days that the dregs may subside, and strain. To a pint of the strained juice add the ginger and pimento, then macerate with a gentle heat for four hours, and strain; boil down the rest of the juice to a pint and a half. Mix the liquors and dissolve the sugar in them; lastly, mix in the spirit.)

Therapeutics. Buckthorn acts as a brisk hydragogue purgative, but its operation is often attended with griping and nausea; formerly it was much employed in dropsical affections, gout, and rheumatism, but its use is now almost abandoned, except in the form of the syrup, which is sometimes given to children; it is however more frequently prescribed as a domestic remedy than by the medical practitioner.

Dose. Of the berries ℈j to ℨj; of syrupus rhamni, f.℥ß to f.℥j.

TEREBINTHACEÆ.

Terebinthina Chia *Lond.* An oleo-resin flowing from the incised trunk of the Pistacia terebinthus; Lin. Syst., Diœcia

pentandria. The tree from which this oleo-resin is obtained grows chiefly in the island of Chios.

Description. This substance is about the consistence of honey, and is semi-transparent, white or pale yellow, having a fragrant odour and warm taste.

Prop. & Comp. It consists of resin dissolved in a volatile oil resembling that of turpentine.

Therapeutics. Its action is the same as that of the other turpentines; *vide* Terebinthina Americana.

Mastiche *Lond.* Resin flowing from the cut bark of Pistacia Lentiscus (var. Chia), Lin., Syst., Diœcia pentandria; native of the countries bordering on the Mediterranean, chiefly obtained from the island of Chios.

Description. In its best condition it occurs in small masses called tears, which are of light yellow colour, friable; the fracture vitreous, shining, and transparent; the surface of the tears is often covered with a whitish dust, produced by the rubbing together of several pieces. The larger masses are less pure than the small; they are formed by the agglutination of several tears, and often mixed with bark and earthy matter. It has but little odour.

Prop. & Comp. It is wholly soluble in ether and chloroform, but scarcely at all so in the fixed oils; it contains a small quantity of volatile oil; alcohol dissolves about four-fifths of it, and the remainder, which is soluble in ether, has been called *Masticine* ($C_{40} H_{31} O_2$).

Off. Prep. It is contained in the Tinct. Ammoniæ Comp. *Lond.*

Therapeutics. The action is the same as that of the resin of turpentine; it is but little used. From its agreeable odour, which it communicates to the breath, it is sometimes employed as a masticatory. Dissolved in ether, it is often used for stopping carious teeth.

Dose. ℈j to ℈ij.

Myrrha *Lond.* Gum resin, exuding from the bark of Balsamodendron Myrrha, Lin. Syst., Octandria monogynia. It is obtained from Arabia and the north-east of Africa.

Description. It occurs in irregular fragments, varying in size; of a reddish-brown colour, translucent, but the surface often

covered with powder; of a peculiar aromatic odour, and pungent warm taste. The inferior variety is in much larger masses than the pure, darker coloured, less transparent, and containing earthy and other impurities. The latter variety is also known as Indian myrrh, from its being imported into England from that country. The best or Turkey myrrh comes by way of Egypt and the Levant.

Prop. & Comp. It contains a *volatile oil, gum, resin,* salts, &c. The resin is bitter, soluble in alcohol, but partly only in ether. With water, myrrh forms an emulsion of a milky-white colour, from the suspension of the resin by the gum which is held in solution.

Off. Prep. TINCTURA MYRRHÆ, LOND. Tincture of Myrrh. (Myrrh powdered ℥iij; rectified spirit Oij. Macerate for seven days, and strain.)

PILULA ALOES CUM MYRRHA, LOND. Pill of Aloes with Myrrh. (Powdered socotrine or hepatic aloes, ℥ß; saffron, myrrh powdered, soft soap, each ʒij; treacle as much as may be necessary. Beat them together, that a mass may be formed.)

Myrrh is also contained in Mist. Ferri C.; Pil. Ferri C.; Pil. Galbani C.; Pil. Rhei C.; and Decoct. Aloes C.

Therapeutics. Myrrh acts as a stimulant in a manner not unlike other resinous substances; it increases the secretion of the mucous membranes, especially of the bronchial tubes, and is supposed to possess antispasmodic and emmenagogue properties, combined with tonic powers.

Myrrh is frequently administered in conjunction with iron and aloetic preparations in amenorrhea; also in leucorrheal and other mucous discharges connected with debility: sometimes as an expectorant in chronic bronchitis and phthisis. Externally, as a topical stimulant, it is applied to aphthous sore mouths, spongy gums, &c.

Dose. Of myrrh, gr. x to ʒß; of tinct. myrrhæ, f.ʒß to f.ʒj. (The tincture is more frequently used externally, mixed with water, to form a gargle.) Of pil. aloes c. myrrhâ, gr. v to gr. xv.

Adulteration. Gum bdellium and other gum resins are occasionally met with in samples of myrrh, and an inferior kind is often substituted for good myrrh.

Rhus Toxicodendron, the leaves of the Rhus Toxicodendron (the poisoned sumach), Lin. Syst., Pentandria trigynia,

not now officinal in the British, but is contained in the United States Pharmacopœia.

Description. The leaves are trifoliate, leaflets entire, or rarely toothed; ovate, deep shining green on the upper surface, hairy on the under.

Prop. & Comp. The leaves contain a peculiar *acrid resin*, and gummy extractive. It is to the presence of the former substance that the properties of the plant depend.

Therapeutics. It is chiefly used as a topical irritant. The juice of the leaves causes inflammation and vesication of the part to which it is applied. Internally administered, it is supposed to act on the spinal system in a manner similar to strychnia; in large doses it causes inflammation, &c. of the stomach. It has been recommended in palsy, but further investigations as to its efficacy are required.

Off. Prep. None: for topical application a tincture of the leaves has been applied.

Dose. Of the powder, gr.ß to gr.j, gradually increased.

Olibanum. Gum resin from the Boswellia Serrata, Lin. Syst., Decandria monogynia. This resin is not now officinal.

Description. It occurs in small oblong tears, of a peculiar balsamic odour.

Prop. & Comp. It burns with an aromatic odour, and contains a *volatile oil*, *resin*, and gum.

Therapeutics. It is stimulant, like the other gum resins, but is chiefly used for burning as an incense in Roman Catholic countries.

Elemi *Lond.* The concrete turpentine from an uncertain plant. This was formerly referred by the London College to the Amyris Elemifera; Lin. Syst., Octandria monogynia. It is probably derived from several different trees of this genus.

Description. It occurs in masses of various sizes and consistence, more or less transparent, of a yellowish colour, and a peculiar odour, and bitter aromatic taste.

Prop. & Comp. The odour is due to the presence of *volatile oil;* the *resin* is soluble in alcohol.

Off. Prep. Unguentum Elemi, Lond. Ointment of Elemi. (Elemi ℥iij; turpentine ℥ijß; suet ℥vj; olive oil f.℥ß. Melt the elemi with the suet, then remove them from the fire, and

immediately mix with the turpentine and oil; and afterwards press through a linen cloth.)

Therapeutics. Action as the turpentines generally; chiefly used externally, in the form of ointment, as a topical stimulant.

Dose. Not given internally.

LEGUMINOSÆ.

PAPILIONACEÆ.

Glycyrrhiza *Lond.* Liquorice. The recent and dried root of Glycyrrhiza glabra; Lin. Syst., Diadelphia decandria; growing in the South of Europe: the fresh root should be kept in dry sand.

Description. In cylindrical pieces, brown on the surface and yellow within, about the size of the little finger.

Prop. & Comp. Contains a peculiar sweet substance, *glycyrrhizine*, not fermentable nor crystalline, soluble in water and spirit; also *asparagine*, gum, mucilage, &c.

Off. Prep. EXTRACTUM GLYCYRRHIZÆ, LOND. Extract of Liquorice. (Fresh liquorice, bruised, ℔ijß; boiling distilled water, two gallons. Macerate for twenty-four hours, then boil down to a gallon, and strain the liquor while hot; lastly, evaporate to a proper consistence.)

Liquorice is also contained in many officinal preparations.

Therapeutics. A sweet demulcent, useful in allaying cough, to sheathe the mucous membranes, &c., but more frequently employed on account of its sweetness. It may be given in any quantities.

Tragacantha *Lond.* The juice (hardened in the air) exuding from the bark of Astragalus Verus, the Milk Vetch, Lin. Syst., Diadephia decandria; growing in Persia and Koordistan.

Description. In semi-transparent flakes, waved concentrically, rough, and difficult to powder, without odour or taste.

Prop. & Comp. Forms with water a very thick tenacious mucilage, and contains two distinct gums: *Arabine*, about $\frac{57}{100}$, like that contained in gum Arabic, &c.; and *Bassorine*, $\frac{47}{100}$, a gum not soluble in water, and, therefore, suspended only in the mucilage.

Off. Prep. PULVIS TRAGACANTHÆ COMPOSITUS, LOND. Compound Tragacanth Powder. (Powdered tragacanth, powdered acacia, starch, each, ℥jß; sugar ℥iij. Rub the starch and sugar together to powder; then the tragacanth and acacia being added, mix them all.)

A mucilage is ordered by the Edinburgh College.

Therapeutics. Simply demulcent, used as gum Arabic; the mucilage is usefully employed to suspend heavy powders, as nitrate of bismuth, &c.

Dose. Of the powder, or of Pulv. Tragacanthæ C. ℈j upwards.

Mucuna *Lond.* The hairs of the fruit of Mucuna Pruriens, Cowhage plant; Lin. Syst., Diadelphia decandria; growing in the West Indies.

Description. The legume or pod is shaped like the Italic letter *f*, about four inches long, and half an inch broad, coriaceous, and covered with numerous stiff, brown, stinging leaves, which have serrations near their points; these are removed, and employed in medicine.

Therapeutics. Cowhage has been used as an anthelmintic, and is supposed to act by its mechanical peculiarities, irritating the entozoa and thus causing expulsion. The watery or alcoholic solutions of mucuna do not possess any such powers.

Dose. Of an electuary of the hairs made with syrup, honey, or treacle, from a tea-spoonful to a table-spoonful or more, followed after a short time by the administration of some purgative.

Scoparius *Lond.* The recent and dried tops of Cytisus Scoparius or Common Broom; Lin. Syst., Diadelphia decandria; growing throughout Europe.

Prop. & Comp. The tops, when fresh, have a peculiar odour, which is lost in drying; the taste is bitter; they contain a principle *Scoparine* (C_{21} H_{11} O_{10}), in yellow tresses, slightly acid; also a liquid alkaloid *Sparteine* (C_{15} H_{13} N), forming crystalline salts; besides which there are extractive matters and salts.

Off. Prep. DECOCTUM SCOPARII COMPOSITUM, LOND. Compound Decoction of Broom. (Broom, bruised juniper, bruised dandelion, each, ℥ß; distilled water Ojß. Boil to a pint, and strain.)

Therapeutics. Broom tops have long been reputed diuretic; probably this effect depends on the principles above noticed: the presence of the common alkaline salts cannot explain their action. Broom is especially useful in dropsies, depending on cardiac disease. In large doses they cause vomiting and purging.

Doses. Of the compound decoction, f.℥j to f.℥iij. A simple decoction is often prepared with about two ounces of the tops to the pint.

Pterocarpus *Lond.* The wood of Pterocarpus Santalinus, Red Sandal Wood, or Red Saunder's Wood; Lin. Syst., Diadelphia decandria; growing in the East Indies.

Description. In billets, which are dense, hard-grained, and of a dark red colour, without odour.

Prop. & Comp. It contains a principle called *Santalin*, crystalline and reddening in air. The colour of the wood is extracted by alcohol and ether, and alkaline solutions.

Off. Prep. It gives colour to Tinct. Lavandulæ Comp. and hence to Liquor Potassæ Arsenitis.

Uses. No therapeutic action; used only as a colouring agent.

Kino (Indicum) *Lond.* The Juice (hardened in the sun) flowing from the incised bark of Pterocarpus Marsupium, or Indian Kino Tree; Lin. Syst., Diadelphia decandria; growing near the Malabar Coast. Other varieties of Kino are met with, as African Kino, from Pterocarpus Erinaceus; Botany Bay Kino, from Eucalyptus Resinifera, &c.

Description. In small angular pieces, broken tears, opaque, ruby red, shining, and brittle. The powder is dark red, has no odour; taste, astringent.

Prop. & Comp. Kino contains a large amount of *tannin*, about 7 per cent., and another astringent principle, found also in Catechu, called *Catechuic acid* (C_{15} H_6 O_6), together with *red gummy matter*, &c.

Off. Prep. Pulvis Kino. Compositus, Lond. Compound Kino Powder. (Kino ʒxv; cinnamon ʒß; dried opium ʒj. Rub them separately into very fine powder; then mix.)

Tinctura Kino., Lond. Tincture of Kino. (Powdered kino ℥iijß; rectified spirit Oij. Macerate for seven days, and strain.)

Therapeutics. A powerful astringent, may be given where

tannin is indicated: it is less soluble than catechu; generally employed in pyrosis and diarrhœa, or as a gargle in relaxed throat. When chewed, it tinges the saliva red, and may be thus used.

Dose. Of powdered kino, gr. x to ℈ß or more; of the compound powder, gr. v upwards, the dose depending more on the opium than the kino. Of the tincture, f.ʒß to f.ʒij.

Balsamum Peruvianum *Lond.* The Balsam flowing from the incised trunks of undetermined species of Myrospermi; now referred to Myrospermum of Sansonate, or Myrospermum Pereiræ, a tree which is known to yield this substance, growing on the Sansonate Coast.

Description. A thick viscid, almost opaque, substance like treacle, but when in thin layers, dark red in colour; of a fragrant peculiar odour, and acrid but aromatic taste.

Prop. & Comp. Sp. gr. 1·15; soluble in alcohol. It is said to consist chiefly of *Cinnamene* ($C_{54}H_{26}O_8$), a colourless fluid, decomposed by alkalines into *cinnamic acid* ($C_{18}H_7O_3$), and *Peruvine* ($C_{18}H_{12}O_2$), and a *resin* ($C_{54}H_{30}O_{12}$), or hydrate of cinnamene. The amount of resin increases with age, and about 6 or 7 per cent. of cinnamic acid is always present, formerly this was thought to be benzoic acid.

Therapeutics. A stimulant, and expectorant; chiefly used in chronic bronchitis and rheumatism. It acts also on other mucous membranes, and may be used to restrain excessive discharges, as gleets, leucorrhœa, &c. Externally, it also acts as a stimulant; useful to bed sores and unhealthy ulcers.

Dose. ♏x to f. ʒß, and upwards, made into an emulsion with mucilage, or yolk of egg.

Balsamum Tolutanum *Lond.* The Balsam (indurated) flowing from the incised trunk of Myrospermum Toluiferum, or Balsam of Tolu Tree; Lin. Syst., Decandria monogynia; growing in Central America, Carthagena, mountains of Tolu, &c.

Description. A reddish-yellow substance, not unlike resin; soft when first imported, becoming hard by age; more or less transparent. Odour and taste the same as balsam of Peru, but less powerful.

Prop. & Comp. Softens by heat, becomes brittle in the cold; is soluble in alcohol and ether; yields cinnamic acid to water;

it is similar in composition to balsam of Peru, containing *cinnamene*, *cinnamic acid*, and *resin*; but a much larger amount of the latter substance is present.

Off. Prep. SYRUPUS TOLUTANUS, LOND. Syrup of Tolu. (Balsam of tolu ʒx; boiling distilled water Oj; sugar ℔s. ijß. Boil the balsam in the water for half-an-hour in a covered vessel, frequently stirring it, and strain the liquor when cold; then add the sugar, and dissolve it.)

TINCTURA TOLUTANA, LOND. Tincture of Tolu. (Balsam of tolu ℥ij; rectified spirit Oij. Macerate the balsam until it be liquefied, and strain.)

It is contained also in Tinct. Benzoini Comp.

Therapeutics. Exactly the same as the balsam of Peru.

Dose. Of the balsam, gr. x to ʒß; of the syrup, f. ʒj to f. ʒiij; of the tincture, f. ʒß to f. ʒij.

CISALPINEÆ.

Hæmatoxylum *Lond.* Logwood, the wood of Hæmatoxylum Campechianum; Lin. Syst., Decandria monogynia, a native of Campeachy; grows in the West Indian Islands and in India.

Description. It occurs in billets, consisting of the heart-wood only, which is heavier than water, of a dark red colour; little odour, but of a very astringent taste. It is cut into chips.

Prop. & Comp. Water and alcohol dissolve the colouring and astringent principles: the solutions are deepened in colour by alkalies, and rendered rather turbid by acids. It contains *hæmatoxyline* ($C_{20} H_{17} O_{15}$), crystallising in reddish-yellow scales; soluble in alcohol and ether, but sparingly so in water. There is also present *tannin*, *resin*, and the ordinary constituents of wood. Hæmatoxyline is occasionally found crystallised in the crevices of the wood.

Off. Prep. DECOCTUM HÆMATOXYLI, LOND. Decoction of Logwood. (Logwood chips ʒx; distilled water Ojß. Boil down to a pint, and strain.)

EXTRACTUM HÆMATOXYLI, LOND. Extract of Logwood. (Logwood chips ℔ijß; boiling distilled water, two gallons. Prepare the extract in the same manner as ordered for Extract of Liquorice.)

Therapeutics. Logwood is chiefly employed as an astringent in affections of the elementary canal, as diarrhœa, chronic

dysentery, and some forms of atonic dyspepsia: it is often given to children. The urine of patients taking logwood exhibits a pink colour, well marked when that fluid becomes alkaline from any cause; in strongly acid urine it may not be seen.

Dose. Of decoctum hæmatoxyli, f.℥j to f.℥ij; of extractum hæmatoxyli, gr. x to ʒß or more.

Senna Alexandrina *Lond.* The Leaf of Cassia Officinalis and Cassia Obovata.

Senna Indica *Lond.* The Leaf of Cassia Officinalis; Lin. Syst., Decandria monogynia; growing chiefly in Northern Africa and India.

Description. There is some considerable difficulty and confusion about the plants yielding senna, arising from different plants having been called by the same name, and different names given to the same plant. The London College simplifies the subject by referring all the officinal sennas to two species, as seen above. Dr. Royle thinks that the species, cassia officinalis, may include the varieties, C. elongata, C. lanceolata, and C. acutifolia; besides which there are other species, cassia obovata, cassia ovata, and cassia Forskalii. Leaflets of these different species are distinguished by their shape, implied in their names; and other peculiarities described in works on Botany.

Alexandrian senna usually consists of leaflets of cassia *officinalis* (var. lanceolata), and of cassia *obovata*, with pods and broken leaf stalks; together with the leaves of *cynanchum argel*, and sometimes, but not in English commerce, with those of *colatea arborescens*, and *coriaria myrtifolia*. Alexandrian senna has been stated to have about the following proportions of ingredients: five parts of the leaflets of cassia officinalis (var. lanceolata), three parts of cassia obovata, and two parts of cynanchum argel. As now sold, it is usually picked and the argel separated.

Cynanchum argel leaves are distinguished by being about one inch long, equal at the base, no lateral nerves on the under-surface; pale in colour, thick and coriaceous in consistence. This addition to senna is important, as the argel gripes and nauseates.

The leaflets of *colatea arborescens*, or bladder senna, are ovate, and equal at the base; those of *coriaria myrtifolia* have a strongly marked lateral nerve on each side of the mid-rib.

The leaflets of *tephrosia apollinea* distinguished by having parallel transverse veins, and being silky on the under surface, have sometimes been met with in Alexandrian senna.

Indian senna may be divided into Tinnevelly senna and the ordinary East India variety: the former is by far the finest, the leaflets being large and thin, from one to two inches in length, of a greenish colour, and generally entire; in the latter, the leaflets are smaller, browner in colour, and many of them broken; stalks and pods are also frequently met with. All the Indian sennas are obtained from one variety of cassia officinalis, viz., C. elongata.

Another variety of commercial senna is called *Tripoli* senna: when good, it consists chiefly of leaflets of C. *Æthiopica,* a variety cassia *ovata,* mixed with cassia *obovata.*

Prop. & Comp. Senna has a faint odour and nauseous taste: it imparts its virtues to water, either hot or cold; also to alcohol: it contains *Cathartine,* which can only be separated as a yellowish-red deliquescent substance, not crystallisable, with a trace of volatile oil, and the ordinary constituents of leaves. The cathartine is stated by some not to be the active principle.

Off. Prep. CONFECTIO SENNÆ, LOND. Confection of Senna. (Senna ℥viij; figs ℔j; prepared tamarinds, prepared cassia, prepared prunes, of each ℔ß; coriander ℥iv; fresh liquorice, bruised, ℥iij; sugar ℔ijß; distilled water Oiij. Rub the senna with the coriander, and by a sieve separate ten ounces of the mixed powder; add the figs and liquorice to the water, and boil down to one half; then press and strain; evaporate the strained liquor in a water-bath, until of the whole, 24 fluid ounces remain; make a syrup by the addition of the sugar; to this mix the tamarinds, cassia, and prunes; a little before they have cooled, add the sifted powder by degrees, stirring constantly with a spatula, until thoroughly incorporated.)

INFUSUM SENNÆ COMPOSITUM, LOND. Infusion of Senna. (Senna ʒxv; bruised ginger ℈iv; boiling distilled water Oj. Macerate for an hour in a closed vessel, and strain.)

TINCTURA SENNÆ COMPOSITA, LOND. Compound Tincture of Senna. (Senna ℥iijß; carraway, bruised, ℥iijß; cardamum, bruised. ʒj; raisins, stoned, ℥v; proof spirit Oij. Macerate for seven days, then press and strain.)

SYRUPUS SENNÆ, LOND. Syrup of Senna. (Senna ℥iijß; fennel, bruised, ʒx; manna ℥iij; boiling distilled water Oj; treacle ℔iij. Macerate the senna and fennel in hot water for six hours, with a gentle heat; press out the liquor strongly through linen, and strain; add the manna to it; evaporate the treacle in a water-bath until some part of it when removed from the fire solidifies; and, while hot, add the liquor, stirring constantly until they are well mixed.)

Therapeutics. Senna is a rather brisk purgative, increasing considerably the peristaltic action, and also to some extent the liquid flow from the intestines; it appears to act chiefly on the small intestines, and less on the colon and rectum than aloes; sometimes nausea and griping are produced if the drug is given alone; it is generally combined with salines, as Epsom salts, or tartrate of potash, and some aromatic; such combination forms the "black draught." Senna is given when constipation is present in dyspepsia, and in almost all febrile and inflammatory diseases; as it is somewhat drastic, it should not be given when the alimentary canal is much affected.

Dose. Of the powdered leaf ʒß to ʒij (a bad form). Of the compound infusion, f. ℥j to f. ℥ij. Of the tincture, f. ʒj to f. ℥ß. Of the confection, from a teaspoonful upwards. Of the syrup, f. ʒj upwards (generally given to infants).

For the *Adulterations* of Senna, see *Description.*

Cassia *Lond.* The fruit of Cassia Fistula; Pudding Pipe Tree, or Purging Cassia; Lin. Syst., Decandria monogynia; from the East Indies and Egypt.

Description. The fruit is a cylindrical pod or legume, from one to two feet long, about the size of the thumb, having three bands extending the whole length, divided internally into numerous cells, spurious dissepiments, each containing a seed, surrounded by a blackish soft pulp, which is the part made use of in medicine. The heavier the pod, the more pulp it contains.

Prop. & Comp. The pulp has a sweetish, rather disagreeable, taste; contains besides sugar, pectin, mucilage, &c., some principle probably similar to that found in senna.

Off. Prep. Cassia Præparata, Lond. Prepared Cassia. (Cassia broken lengthwise, ℔j; distilled water, sufficient to cover the cassia. Macerate for six hours, stirring constantly; strain the washed pulp through a hair-sieve, and evaporate in a water-bath to the consistence of a confection.)

Confectio Cassiæ, Lond. Confection of Cassia. (Prepared cassia ℔ß; manna ℥ij; prepared tamarinds ℥j; syrup of roses ℥viij. Bruise the manna, then dissolve it in the syrup; afterwards mix in the tamarind and cassia, and evaporate to a proper consistence.)

Cassia is also contained in Confectio Sennæ.

Therapeutics. A slight laxative, apt to give rise to disturbance of the bowels, producing flatulence; seldom given alone.

Dose. Of confectio cassiæ, ʒij upwards; the same, of the prepared pulp.

Tamarindus *Lond.* The pulp of the fruit of Tamarindus Indica or Tamarind tree; Lin. Syst., Monodelphia triandria, growing in the East and West Indies. The East Indian pod is larger than that from the West Indies.

Description. The pods are about 4 or 5 inches long, and ¾ inch broad, flattened and curved; internally divided into cells containing oval seeds, surrounded by the pulp, which is soft, of a brownish-red colour, and sweet acidulous taste.

Prop. & Comp. It contains sugar, pectin, free *citric* and *tartaric* acids, and *bitartrate of potash*, &c.

Off. Prep. TAMARINDUS PRÆPARATUS, LOND. Prepared Tamarinds. (Tamarinds ℔j; water, as much as necessary to cover the tamarinds. Macerate with a gentle heat for four hours, and complete the process as directed for Prunum Præparatum.)

Tamarinds are contained in Confectio Sennæ and Confectio Cassiæ.

Therapeutics. Tamarinds act as a very slight laxative, besides which they are refrigerant from the acids contained, and useful, when infused as a cooling drink, in febrile affections.

Dose. ʒij upwards. A whey may be made by boiling the pulp with milk.

Copaiba *Lond.* An oleo-resin flowing from the incised trunk of Copaifera Multijuga and other species; the varieties of Copaiva tree; Lin. Syst., Decandria monogynia; growing in the West Indies and tropical parts of America.

Copaibæ Oleum, *Lond.* Oil distilled from the oleo-resin.

Description. A transparent liquid, about the consistence of thick oil, of a yellow colour, characteristic odour, and slightly acrid, nauseous, terebinthinate taste. The Brazilian variety, which is chiefly met with, is much paler than the West Indian. The volatile oil is a colourless liquid with the odour and taste of copaiba.

Prop. & Comp. The so-called Balsam of Copaiba or Copaiva consists of about 45 per cent. of *resin*, and 34 per cent. of the *volatile oil*, but the proportions vary with age and exposure; its sp. gr. is about 0·95; the resin, copaivic acid ($C_{40}H_{32}O_4$), resembles closely common resin, and is crystalline. The volatile

oil ($C_{10}H_8$), except in odour and taste, is closely allied to oil of turpentine. Besides these principles, about 1½ or 2 per cent. of a soft brown resinous matter is contained in copaiva, the nature of which is unknown; it seems to increase in amount as the copaiva becomes old.

Therapeutics. Copaiva acts as a stimulant like other terebinthinate drugs; its influence is more particularly directed to the mucous membranes, especially that of the genito-urinary organs: when taken into the stomach it becomes absorbed, and can be detected both in the breath and urine by the peculiarity of its odour; from the latter fluid it may be separated by ether. It is used with much success in affections of the urethra and bladder, as gonorrhea and gleet, but may also be given advantageously in chronic bronchitis, accompanied by excessive secretion of mucus, and in diseased conditions of the mucous membrane of the rectum; it should be avoided in febrile states of the system, as it acts also as a general stimulant. In large doses it occasionally gives rise to a papular eruption on the skin. The action of the *volatile oil* resembles that of the balsam itself.

Dose. Of the copaiba, ♏xv to f.ʒß or more; of oleum copaibæ, ♏x to f.ʒß Copaiva may be taken rubbed up with the yolk of egg, or floating upon water or some other liquid, or made into pills with burnt magnesia, or, lastly, dissolved in water by the aid of liquor potassæ, with which it forms a soap. Sometimes to hide its disagreeable taste it is put into membranous or gelatinous capsules.

Adulteration. Turpentine and fixed oils may be mixed with copaiva: if a little of the suspected drug is heated on paper, turpentine can be detected by the odour, and all fixed oils by a greasy ring surrounding the resinous stain which pure copaiva leaves.

Mimosæ.

Acacia *Lond.* Acacia gum, exuding from the bark of various species of Acacia, as Acacia Vera, Mimosa, Arabica, &c., and hardened in the air; Lin. Syst., Polygamia monœcia; growing in Africa and India.

Description. Gum is in general a natural exudation from the trees, sometimes incisions are made to favour the flow; it occurs in small rounded tears of different sizes, almost white and opaque from innumerable fissures on the surface; brittle, devoid of odour, and with only a mucilaginous taste. Other varieties of gum, as Senegal and Barbary gum in larger tears, more

coloured, and less pure, are found in commerce; the produce of different Acacias, as A. Senegal and A. Gummifera.

Prop. & Comp. Gum is entirely soluble in water if pure, forming a mucilage; it contains usually about 17 per cent. of water, and leaves on incineration 3 per cent. of ash: the principal ingredient is named *Arabine*, whose watery solution is precipitated by alcohol and diacetate of lead, but not by the neutral acetate. Composition (C_{12} H_{11} O_{11}): it is converted by nitric acid into *mucic* acid, but is not convertible into sugar.

Off. Prep. MISTURA ACACIÆ, LOND. Mucilage or Gum Mixture. (Powdered acacia ℥x; boiling distilled water, Oj. Rub the acacia with the water gradually poured in, until it be dissolved.)

Gum is contained also in Pulv. Tragacanth. C. and other officinal preparations.

Therapeutics. Gum acts simply as a demulcent, and is sometimes employed to allay irritation of the mucous membranes, as of the fauces, pharynx, and stomach; it is, however, more frequently used for the purpose of suspending heavy powders, as nitrate of bismuth, oxide of zinc, &c., when administered in the liquid form; also to unite substances into the form of lozenges. Gum has been used also in diabetes mellitus, as a substitute for amylaceous matters, as it is not converted into sugar, but its use does not appear to be attended with any real benefit: whether it passes into the urine unchanged is not known; it is, however, often used in irritation of the bladder and urethra.

Dose. Gum may be given *ad libitum;* the author has given half a pound per diem in diabetes, without any perceptible symptom being produced.

Catechu *Lond.* Catechu, an extract from the *wood* of Acacia; Catechu; Lin. Syst., Polygamia monœcia; growing in the East Indies and Jamaica: or, an extract from the *leaf* of Uncaria Gambir, Lin. Syst., Pentandria monogynia, belonging to the natural order *Cinchonaceæ*, growing in the islands of the Eastern Archipelago.

Description. There are two well-marked varieties of catechu, the dark and pale kinds. The *dark catechu*, produced by the Acacia catechu, occurs in irregular-shaped masses, hard, yet brittle; of a blackish-red colour and shining surface, very astringent and bitter taste, followed by an impression of sweetness. The *pale catechu* occurs in cubical pieces, which are porous in texture, of a reddish-brown colour, dull earthy fracture, bitter and astringent taste: it is the produce of Uncaria Gambir. There

are many other trees which yield catechu, as the Areca catechu, or Betel-nut, &c. In fact, the extracts of the different parts of many plants possess properties not unlike the substances under consideration.

Prop. & Comp. Dark catechu is heavier than pale. The former has sp. gr. 1·45; the latter 1·39. In composition they are closely allied, containing *tannin*, *catechuic* acid, or *catechine* ($C_{15}\ H_6\ O_6$); crystallising in white needles, and little soluble in water, but soluble in alcohol and ether; the solutions not precipitating gelatine, and striking green with per-salts of iron; converted by the action of alkalies into *Japonic* and *Rubinic* acids. Besides these principles, an extractive matter, mucilage, and insoluble compounds exist in catechu. Sir H. Davy found the following per-centage of principles in pale and dark catechu. Under the head of tannin, catechuine is included.

	Tannin.	Extractine.	Mucilage.	Insoluble Matters.
Pale Catechu .	48·5	36·5	8·0	7·0
Dark Catechu .	54·5	34·0	6·5	5·0

The London College gives the following tests of the goodness. The pale variety is almost entirely soluble in boiling water, and the solution when cool should not strike blue with iodide of potassium and nitric acid, or with free iodine, showing the absence of starch; and 100 grains of either variety should yield to ether such a quantity of matter, that 40 grains of the ethereal extract should be soluble in cold water.

Off. Prep. Infusum Catechu Compositum, Lond. Compound Infusion of Catechu. (Powdered catechu, ʒvj; bruised cinnamon, ʒj; boiling distilled water, Oj. Macerate for an hour in a closed vessel, and strain.)

Tinctura Catechu Composita, Lond. Compound Tincture of Catechu. (Powdered catechu, ℥iijß; cinnamon, bruised, ℥ijß; proof spirit, Oij. Macerate for seven days; then press, and strain.)

Therapeutics. Catechu acts as a very powerful astringent, from the tannin and catechine contained in it. For a detail of the action, see Tannin and Gallic Acid. The catechine is also astringent, but as it is very insoluble, its action is probably more local. Catechu is used chiefly in affections of the alimentary canal, as in diarrhœa, some forms of atonic dyspepsia, accompanied with pyrosis; it may also be employed as a remote astringent in hæmorrhages and mucous discharges. Externally it may be used in the form of ointment, but has no advantage over the ointment of gall-nuts; it may be chewed, and the juice gradu-

ally swallowed in relaxed conditions of the uvula, palate, &c., and in some forms of hoarseness.

Dose. Of the powder, gr. x to ʒß, or more; of infusum catechu compositum, f.℥j to f.℥jß; of tinct. catechu composita, f.ʒj to f.ʒij.

Indigo, prepared from several species of Indigofera; Nat. Order, Leguminosæ; is introduced into the London Pharmacopœia in the following preparation.

Liquor Indigo Sulphatis *Lond. Appendix.* Solution of Sulphate of Indigo.

Prep. By dissolving indigo in Nord-hausen sulphuric acid.

Prop. & Comp. Indigo owes its fine colour to the presence of a peculiar substance, *Indigotin* ($C_{16}\ H_5\ NO_2$); it is insoluble in water, but by the action of deoxidating agents it is changed into white indigo, which contains one more atom of hydrogen than indigotin: this is soluble in water, and by exposure to the air becomes reconverted into the blue variety. The solution of sulphate of indigo contains a peculiar compound of the acid and the colouring matter, called sulph-indylic acid, formula ($C_{10}\ H_5\ NO_2 + 2\ SO_3$). This solution is used as a test for free *chlorine* in hydrochloric acid and liquor sodæ chlorinatæ; if free chlorine be present, the colour is destroyed.

Therapeutics. The action of indigo as a therapeutic agent requires further investigation; it has been employed in epilepsy; it colours the urine green or bluish-green.

ROSACEÆ.

Rosa Centifolia *Lond.* The fresh petals of Rosa Centifolia, the Cabbage, Damask, or hundred-leaved Rose; Lin. Syst., Icosandria polygynia; cultivated in Europe; a native of Persia and the Caucasus.

Description. The petals, familiar to all, are ordered to be used when fresh, as they lose their odour by drying.

Prop. & Comp. Odour fragrant, depending upon a *volatile oil;* besides this, some colouring matter, and a slight laxative principle exist in the petals, and a trace of *tannin* or *gallic acid.*

Off. Prep. Aqua Rosæ, Lond. Rose Water. (Damask rose petals ℔x; water, two gallons. Let a gallon distil.)

Syrupus Rosæ, Lond. Syrup of Rose. (Damask rose petals ℥vij; sugar ℔vj; boiling distilled water Oiij; rectified spirit, f. ℥vſs. Macerate the rose petals in the water for twelve hours, and strain; evaporate the strained liquor in a water-bath to two pints, and in this dissolve the sugar; lastly, mix the spirit with it.)

Oleum Rosæ, or Attar of Roses. The volatile oil is officinal in the Edinburgh and Dublin Pharmacopœias; it is prepared in India; a very small quantity exists in the rose petals.

Therapeutics. Rose water is used only as an agreeable vehicle for the administration of medicines; much employed in making lotions. The syrup is very slightly laxative, and given occasionally to young children.

Dose. Of the syrup ʒij to ℥ſs.

Rosa Gallica *Lond.* The fresh and dried petals of the unblown flower of Rosa Gallica, the Red or French Rose; Lin. Syst., Icosandria polygynia; grows in Austria and South of Europe; cultivated in England.

Description. The flower-buds deprived of the calyx and claws are employed in medicine; about the size of a nutmeg, of a purplish-red colour, slight odour, and astringent taste.

Prop. & Comp. The petals contain *red colouring matter*, *tannin* or *gallic acid*, and a trace of volatile oil; the colour is acted on by light. An infusion of the petals becomes bright red with acids, and green with alkalies.

Off. Prep. Confectio Rosæ, Lond. Confection of Rose. (Fresh red rose petals ℔j; sugar ℔iij. Pound the rose petals in a stone mortar; add the sugar, and pound them again until incorporated.)

Infusum Rosæ Compositum, Lond. Compound Infusion of Roses. (Red rose leaves, dried, ʒiij; dilute sulphuric acid ʒjſs; sugar ʒvj; boiling distilled water Oj. Pour the water on the rose, first separating the petals; then add the acid. Macerate for two hours, and strain off the liquor; lastly add the sugar.) It is of a bright red colour, from the action of the sulphuric acid on the colouring matter.

Mel Rosæ, Lond. Honey of Rose. (Dried red rose ℥iv; boiling distilled water ℥xxiv; honey ℔v. Macerate the rose petals, first separated, in sixteen fluid ounces of water for two

hours; then lightly press with the hand, and strain; what remains macerate again for a little time in the rest of the water, and pour off the liquor; to this add half the first infusion, and set aside the other half; then add the mixed liquors to the honey, and evaporate in a water-bath, that upon the solution which was set aside being added, it may become a proper consistence.)

Therapeutics. Red rose petals are astringent, from tannin or gallic acid; they are, however, often used on account of their colouring matter. The confection is employed as a pill basis, occasionally as a slight astringent, and applied in aphthous conditions of the mouth in the form of a linctus. The compound infusion makes an excellent gargle, and is given internally as an astringent or as a vehicle for more powerful medicines, as Epsom salts, disulphate of quina, &c. Mel Rosæ is a favourite astringent application to aphthæ in children.

Dose. Of the confection, ʒj or more; of the compound infusion, f.℥j to f.℥ij; of the honey, f.ʒj or more, if given internally.

Rosa Canina *Lond.* The fresh fruit of Rosa Canina, the Dog Rose; Lin. Syst., Icosandria polygynia; indigenous.

Description. The so-called fruit consists of the succulent inferior part of the calyx; on section, hairy achænia are seen, with the carpels or true fruit; the pulp is sweet and acidulous.

Prop. & Comp. The pulp contains *citric* and *malic* acids, with citrates, malates, sugar, a little tannin, and trace of volatile oil.

Off. Prep. Confectio Rosæ Caninæ, Lond. Confection of Dog Rose. (Dog rose fruit, deprived of its seeds, ℔j; sugar, powdered, ℥xx. Rub the rose (pulp), gradually adding the sugar, until thoroughly incorporated.)

Therapeutics. A slight refrigerant, also somewhat astringent. In the form of the confection it is used to form a linctus, and also as a pill basis.

Dose. ʒj or more.

Tormentilla *Lond.* Tormentil, the rhizome of Potentilla Tormentilla; Lin. Syst., Icosandria polygynia; indigenous.

Description. The rhizome is oblong in shape, knotty, and has numerous radicles attached to it, of a dark-brown colour externally, and reddish-brown within.

Prop. & Comp. Tormentilla has a very astringent taste, contains about 17 per cent. of *tannin*, also colouring and gummy matters, and a trace of volatile oil.

Off. Prep. DECOCTUM TORMENTILLÆ, LOND. Decoction of Tormentil. (Bruised Tormentil ℥ij; distilled water Ojß. Boil down to a pint, and strain.)

Therapeutics. A powerful astringent, given sometimes in diarrhœa; also in the form of decoction as a gargle or injection: it may be used in all cases where tannin is indicated.

Dose. Of powdered tormentil, ℈j to ʒj or more; of decoction, f.ʒj to f.℥ij.

Cydonium *Lond.* The seed of Cydonia vulgaris, the common Quince; Lin. Syst., Icosandria pentagynia; grows in the South of Europe and Candia; cultivated in England.

Description. The seeds are ovate, pointed, convex on one side, and flattened on the other; of a brownish colour; the seed-coat contains much mucilage, which it yields to boiling water.

Prop. & Comp. The mucilage from the seeds has the properties of other mucilage, being precipitated by both acetate and diacetate of lead.

Off. Prep. DECOCTUM CYDONII, LOND. Decoction of Quince-Seeds. (Quince seeds ʒij; distilled water Oj. Boil for ten minutes, then strain.)

Therapeutics. A demulcent; used only externally to cracks in skin, &c.

Amygdala (Jordanica) *Lond.* Jordan Almond. The seed of Amygdala communis (the sweet variety), the Sweet Almond Tree; Lin. Syst., Icosandria monogynia; growing in Syria, Persia, also in Northern Africa and Southern Europe.

Amygdalæ (Oleum) *Lond.* Almond Oil. The oil expressed from the seeds of Amygdalus communis (both bitter and sweet varieties).

Description. The character of the almond is well known, the bitter is the smaller of the two. The oil is of a very pale yellow colour, made by expression, and whether obtained from the sweet or bitter variety is the same in properties and composition.

Prop. & Comp. Both varieties of almonds contain about 50 per cent. of the *fixed oil,* an albuminous principle, soluble in water, called *Emulsine,* with sugar, gum, and woody fibre ; the bitter variety, in addition to these, possesses a peculiar white crystalline principle, *Amygdaline* ($C_{40}\ H_{27}\ N\ O_{22}$) soluble in water and alcohol, the solutions having a slightly bitter taste: it is to the presence of this body that the peculiar properties of the bitter almond are due, for when amygdaline is acted upon by the emulsine, as occurs on moistening the almond, a species of fermentation ensues, and *hydrocyanic acid* (H Cy) and *volatile oil of bitter almonds* or hydruret of benzule ($C_{14}\ H_5\ O_2 + H$) are formed, with a little sugar and formic acid, and hence poisonous effects may result from such a decomposition.

The *volatile oil,* when deprived of the prussic acid, resembles in appearance other volatile oils, is not poisonous, and on exposure absorbs oxygen, and is converted into benzoic acid ($C_{14}\ H_5\ O_3 + H\ O$); it is procured by distilling the marc, left after the expression of the fixed oil from bitter almonds, with water, and that sold in the shops is intensely poisonous from the large amount (from 4 to 8 per cent.) of prussic acid contained in it.

The *fixed oil,* sp. gr. 0·92, consists of margarine dissolved in oleine, and possesses no peculiar properties distinguishing it from other fixed oils. The bitter almond is not officinal, except as a source of the fixed oil.

Off. Prep. CONFECTIO AMYGDALÆ, LOND. Confection of Almond. (Sweet almonds ℥viij; powdered acacia ℥j; sugar ℥iv. Macerate the almonds in cold water, and deprive of their external coats ; then bruise and rub them through a fine metallic sieve; add the other ingredients, and beat all together until thoroughly mixed. This confection will keep longer sound, if the almonds first decorticated, dried, and rubbed into the finest powder, be mixed with the acacia and sugar, separately powdered, and the mixed ingredients be kept in a well-stoppered bottle.)

MISTURA AMYGDALÆ, LOND. Mixture of Almond. (Confection of almond, ℥ijß; distilled water Oj. Gradually add the water to the confection of almond while triturating, until they are mixed; then strain through linen.)

Therapeutics. Sweet almonds are nutritive, from the albuminous, oleaginous, and saccharine matters contained in them; they are likewise demulcent, and are either used on account of this property, or more commonly the officinal preparations are employed as vehicles for the exhibition of other remedies; the fixed oil may be also used as a demulcent; in large doses it is

purgative. Bitter almonds are poisonous in large quantities, and their exhibition is not advisable, the amount of prussic acid generated being very variable, and the officinal acid can always be prescribed with equal advantage and much greater safety; *vide* Acidum Hydrocyanicum dilutum.

Dose. Of confectio amygdalæ ʒj to ʒij; of mistura amygdalæ, f.℥j to f.℥ij; of oleum *amygdalæ* (fixed) f.ʒj to f.℥ß.

Prunum *Lond.* The Prune, the dried fruit of the Prunus domestica or common Plum tree; Lin. Syst., Icosandria monogynia; growing in Syria and in different parts of Europe.

Description. The finest and sweetest varieties are used as a condiment; the smaller kind, more acid and less pleasant, are employed in medicine.

Prop. & Comp. Prunes contain some malic acid, sugar, and a purgative principle the nature of which is unknown.

Off. Prep. PRUNUM PRÆPARATUM, LOND. Prepared Prune. (Prunes ℔j; water, sufficient to cover the prunes. Boil gently for four hours, press the softened pulp first through a fine sieve made of cane, and afterwards through a fine hair-sieve. Lastly, evaporate the pulp in a water-bath to the consistence of a confection.)

Prunes are contained in confect. sennæ.

Therapeutics. Seldom prescribed by the physician, but often used as a laxative, or domestic medicine; they are somewhat apt to cause flatulence and griping.

Dose. ℥ij and upwards. Prunes are often added to an infusion of senna to increase its purgative property, and render it more palateable.

Lauro-Cerasus *Edin. Dub.* The leaves of Prunus Lauro-Cerasus, or Cerasus Lauro-Cerasus, the Cherry Laurel; Lin. Syst., Icosandria monogynia; a native of Asia Minor, but cultivated in English gardens.

Description. The leaves of the cherry laurel are four or five inches long, and about two broad; coriaceous in texture, acuminate, with a few dentations; shining and smooth on the upper surface, dull on the under and of a lighter colour, with two or four glands.

Prop. & Comp. On distillation with water they yield volatile oil and some prussic acid: neither of these substances are present

as such in the leaves; *amygdaline*, however, exists in them, and it is by the decomposition of this principle that the above products are obtained.

Off. Prep. AQUA LAURO-CERASI, EDIN. Cherry Laurel Water. (Fresh leaves of cherry laurel ℔j; water Oijß; compound spirit of lavender ℥j. Chop down the leaves, mix them with the water, distil off one pint, agitate the distilled liquid well, filter it if any milkiness remain after a few seconds of rest, and then add the lavender spirit.) The Dublin preparation is the same, without the spirits of lavender.

Therapeutics. Action as that of prussic acid. The strength of the above preparation is very variable, and this fact constitutes the great objection to its use, especially as all the valuable effects may be obtained by the use of the officinal acid.

Dose. ♏x to ♏xx.

Kousso. The flowers of Brayera Anthelmintica; they are said to be diœcious. The tree is a native of Abyssinia, growing chiefly on elevated ground, several thousand feet above the level of the sea.

Description. The general colour of kousso, viewed *en masse*, is yellowish-green, with the purple edges of the petals of the flower appearing pretty frequently streaking the ground colour. It has a peculiar odour, somewhat like that of tea. It is safer to buy it with the flowers whole than in a state of powder, as in the latter case, owing to its expensive nature, it is more readily adulterated.

Prop. & Comp. It may be obtained either in the form of powder or of the dried flowers. It contains a volatile oil, gum, sugar, &c., and a crystallisable principle, *Koussine;* but whether its active properties depend on the latter substance is unknown.

Off. Prep. None. Generally given in the form of infusion, or rather of infusion and suspension. About f.℥x of lukewarm water are poured on half an ounce of the flowers, and allowed to stand for a quarter of an hour; the mixture is then well stirred, and the infusion, with the residue of the flowers, are swallowed together.

Therapeutics. Kousso acts as an efficient anthelmintic. Whether it is superior to other remedies of the same class, is as yet doubtful; it has little or no cathartic power, and the subsequent administration of a purgative is generally required. It

seems to act by destroying the life of the entozoa. It has been chiefly employed in cases where the tape-worm is suspected, or known to be present. Occasionally nausea, and even vomiting, is induced by the drug.

Dose. ℥ß for an adult; ʒj to ʒij for a child.

MYRTACEÆ.

Caryophyllum *Lond.* Cloves. The unexpanded flower of Caryophyllus Aromaticus, or Clove Tree; Lin. Syst., Icosandria monogynia; growing in the East Indian Islands.

Caryophylli Oleum LOND. Oil of Cloves. Distilled from the unexpanded flower.

Description. The clove is a small, tapering, nail-like body, consisting of a four-toothed calyx, between which the unopened corolla is seen as a round ball, of a dark brown colour, and hot taste. The oil, light yellow when fresh, sp. gr. 1·061, has the odour and burning taste of the clove.

Prop. & Comp. Cloves, besides the volatile oil, contain *resin, tannin,* and woody fibre. The *volatile oil* consists of a light portion (C_{10} H_8), and a heavy one (C_{24} H_{15} O_5); a crystalline body *Caryophylline* (C_{20} H_{16} O_2) has been found in cloves, and another soluble in water, *Eugenine.*

Off. Prep. INFUSUM CARYOPHYLLI, LOND. Infusion of Cloves. (Bruised cloves ʒiij; boiling distilled water Oj. Macerate for two hours in a closed vessel, and strain.)

Cloves are contained also in several other officinal preparations, as Inf. Aurantii C., Vin. Opii, &c.

Therapeutics. Cloves and the oil are stimulant, aromatic, and carminative; employed in atonic dyspepsia, to allay vomiting in pregnancy, and relieve flatulence. The oil may be used as an adjunct to purgatives; or locally to arrest the pain of carious teeth.

Dose. Of the powdered clove, gr. v to ℈j or more; of the infusion, f.℥j to f.℥ij; of the oil, ♏j to ♏v or more.

Incompatibles. Solutions containing cloves strike black with salts of iron, on account of the tannin.

Pimenta *Lond.* The unripe fruit of Eugenia Pimenta, Pimento or Allspice Tree; Lin. Syst., Icosandria monogynia; growing in the West Indian Islands.

Pimentæ Oleum *Lond.* The oil distilled from the fruit.

Description. A small round two-celled berry, rather larger than pepper; brown and rough on the surface; of an aromatic odour, and hot, aromatic taste.

Prop. & Comp. The *volatile oil,* yellow, sp. gr. 1·021; consists of two portions; a light and heavy oil, as that from cloves: besides which allspice contains a fixed oil, *resin, tannin,* and less important ingredients. The cortical portion is the most active.

Off. Prep. Aqua Pimentæ, Lond. Pimenta Water. (Pimento, bruised, ℔j; water, 2 gallons. Let a gallon distil. This water may be more quickly prepared from oil of pimento, in the same manner as has been directed for Dill Water.)

Spiritus Pimentæ, Lond. Spirits of Pimenta. (Oil of pimento, f.ʒij; proof spirit, a gallon. Dissolve.)

Therapeutics. The same as cloves.

Dose. Of the powder, gr. v to ℈j or more; of aqua pimentæ, f.℥j to f.℥ij; of spiritus pimentæ, f.ʒj to ʒij; of the oil, ♏j to ♏v.

Cajuputi *Lond.* Cajeput Oil. The oil, distilled from the leaf of Melaleuca minor, or Cajeput Tree; Lin. Syst., Polyadelphia icosandria; growing in Amboyna and other East Indian Islands.

Description. A transparent oil, of a green colour, with a strong camphoraceous and cardamom-like odour and taste; a small quantity only is yielded by the leaf.

Prop. & Comp. Sp. gr. 0·914; when distilled, at first a colourless oil passes over. Formula (C_{10} H_9 O.)

Therapeutics. A powerful topical and general stimulant and antispasmodic, employed in flatulent colic, hysteria, and cholera; also in chronic rheumatism and low states of the system. Externally, when mixed with olive oil, it is used over chronic rheumatic and gouty parts.

Dose. ♏j to ♏v, or more.

Adulteration. Copper has been detected in certain samples, but is not essential to the green colour of the oil. Camphor, dissolved in oil of rosemary, and coloured by copper, has been stated to have been substituted for the genuine oil.

GRANACEÆ.

Granatum *Lond.* The rind of the fruit of Punica Granatum, or Pomegranate; Lin. Syst., Icosandria monogynia; growing on the shores of the Mediterranean and the South of Europe.

Granati Radix *Lond.* The bark of the root of the same.

Description. The *fruit* resembles an orange, but has a coriaceous rind, and is crowned with a toothed calyx. The *root bark* occurs in thin quilled pieces, of a greyish colour externally, yellow within.

Prop. & Comp. The rind of the fruit contains *tannin*, about 20 per cent., with extractive and mucilaginous matters; the root bark contains about the same quantity of *tannin*, and a principle called *Punicine* has also been detected.

Off. Prep. Decoctum Granati, Lond. Decoction of Pomegranate. (Pomegranate (rind) ℥ij; distilled water Ojß. Boil down to a pint, and strain.)

Decoctum Granati Radicis, Lond. Decoction of the Bark of Pomegranate Root. (Bark of pomegranate root, sliced, ℥ij; distilled water Oij. Boil down to a pint, and strain.)

Therapeutics. The rind of the fruit is powerfully astringent, from the tannin contained, and may be used externally and internally when astringents are indicated. The root appears to possess anthelmintic properties, and has been employed for the expulsion of tape-worms.

Dose. Of either decoction, f.ʒj to f.℥iij, or more.

CUCURBITACEÆ.

Colocynthis *Lond.* The decorticated fruit of Citrullus (Cucumis) Colocynthis, or Colocynth Gourd; Lin. Syst., Monœcia monadelphia; a plant growing on the shores of the Mediterranean and India.

Description. The fruit is imported from Mogador unpeeled, from the Mediterranean ports peeled. It consists of a globular pepo, about the size of an orange; the rind is hard and yellow, the pulp very light and porous, tough, and enclosing the seeds,

which form 72 per cent. of its weight, and are ordered to be removed in making the extract.

Prop. & Comp. Intensely bitter; contains a principle, *colocynthin*, soluble in water, alcohol, and ether; of a yellowish resinous appearance. Composition unknown; not yet crystallised.

Off. Prep. ENEMA COLOCYNTHIDIS, LOND. Enema of Colocynth. (Extract of colocynth ʒß; soft soap ℥j; water Oj. Mix, and rub together.)

EXTRACTUM COLOCYNTHIDIS, LOND. Extract of Colocynth. (Colocynth, cut in pieces and deprived of its seeds, ℔iij; distilled water, half a gallon. Macerate the colocynth for thirty-six hours, frequently squeezing it with the hand. Press out the liquor strongly, and finally evaporate to a proper consistence.)

PILULA COLOCYNTHIDIS COMPOSITA, LOND. Compound Colocynth Pill. (Extract of colocynth ʒj; powdered extract of aloes ʒvj; powdered scammony ʒij; powdered cardamom ʒß; soft soap ʒjß. Mix the powders, then add the other ingredients; beat all together, to form a mass.)

Therapeutics. Colocynth is a powerful drastic purgative, producing watery evacuations; when given alone, it is apt to gripe; useful as an adjunct to other purgatives, to give briskness. It is employed in obstinate constipation, febrile conditions, and to relieve the portal system in dropsical effusions, and uterine obstructions; also as a derivative in head affections.

Dose. Of the powdered pulp, gr. ij and upwards; rarely used: of the simple extract, gr. ij to gr. x; of pil. coloc. comp., gr. v to gr. xv.

Adulteration. The extract is not unfrequently made with the pulp and seeds, which yields more, but a less active product; the use of a greater quantity of water also gives a less active preparation.

Elaterium *Lond.* The fresh fruit, not quite ripe, of Ecbalium Officinarum, Spirting or Wild Cucumber; Lin. Syst., Monœcia syngenesia; growing in Greece and southern parts of Europe; also cultivated in England.

Description. The fruit is a small elliptical pepo, about 1½ in. long, covered with soft prickles, containing the seeds surrounded by a juicy tissue: these, when ripe, are expelled forcibly, hence the English name.

Prop. & Comp. From the juice of the interior of the pepo,

on standing, a subsidence takes place, which, when collected, is named Elaterium or Extractum Elaterii (for mode of preparation see below). This is the active part and occurs in the form of thin flattened pieces, light, friable, of a green colour, when fresh, but on exposure to light becomes grey; it consists of *Elaterine* or *Momordicine* ($C_6 H_{12} O_5$) in silky prisms, soluble in alcohol, but very slightly so in water or ether, forming in good elaterine, from 35 to 45 per cent., a *green resinous matter*, soluble in ether, together with woody fibre, &c.

Off. Prep. EXTRACTUM ELATERII, LOND. Extract of Elaterium. (Elaterium (*pepos*) ℔j. Slice the pepos lengthwise and strain the juice, very gently expressed, through a very fine hair-sieve; then set it by for some hours, until the thicker part has subsided; the thinner supernatant fluid being thrown away, dry the thicker portion with a gentle heat.)

Therapeutics. A drastic hydragogue purgative, used chiefly in dropsical affections, especially those connected with cardiac disease; sometimes causes nausea and great depression, hence it should be carefully administered; also apt to produce gastro-enteritis.

Dose. Of elaterium (good), gr. $\frac{1}{12}$ to gr. $\frac{1}{2}$; of elaterine or momordicine, gr. $\frac{1}{24}$ to gr. $\frac{1}{6}$.

Adulteration. Elaterium is often very inferior, containing starch or flour, also chalk, and but little elaterine, often not more than $\frac{4 \text{ or } 6}{100}$: it should not give a blue colour with iodine, nor effervesce when an acid is added.

UMBELLIFERÆ.

Conium *Lond.* The recent and dried leaf of Conium Maculatum, Hemlock (the wild herb); Lin. Syst., Pentandria digynia; indigenous, growing in hedges and wild places.

Description. The leaves are deep green, shining, tripinnate with pinnatifid leaflets, petioles furrowed and sheathing at the base; the stem is smooth and purple-spotted. The seeds, or rather fruit, used in procuring the alkaloid are distinguished from other umbelliferous fruits, by having undulating crenulated ridges and no vittæ.

Prop. & Comp. The leaves, when fresh, have a peculiar odour. All parts contain *Conia* ($C_{17} H_{17} N$), a liquid volatile alkaloid, with powerful odour, united with *Coniic acid*, and a trace of *volatile oil.* When potash is added to any part of the plant the

conia is set free, detected by its odour and fuming with hydrochloric acid.

Off. Prep. CATAPLASMA CONII, LOND. Cataplasm of Hemlock. (Boiling water, f.℥x; powdered linseed ℥ivß, or as much as may be sufficient; extract of conium ℥j. Add the linseed gradually to the water, constantly stirring, to make a cataplasm; upon this spread the extract, first softened with water.)

EXTRACTUM CONII, LOND. Extract of Hemlock. (To be prepared in the same manner as directed under Extract of Aconite.)

TINCTURA CONII, LOND. Tincture of Hemlock. (Conium, dried, ℥v; proof spirit Oij. Macerate for seven days, then press and strain.)

UNGUENTUM CONII, LOND. Hemlock Ointment. (Fresh conium, lard, each, ℔j. Boil the conium with the lard, until it becomes crisp, then press through a linen cloth.)

Therapeutics. Conium seems to act as a direct sedative, especially on the spinal cord, and in very large doses causes paralysis; it is used to allay cough in bronchitic affections, pertussis, and phthisis; formerly thought to be curative of cancerous diseases; it often alleviates in such cases, allaying pain and improving general health. Conium may also be applied externally to ease pain.

Dose. Of the powdered leaf, gr. iij to gr. x or more; of the extract, gr.ij to gr. v or more; of the tincture, ♏xx to f.ʒj or more.

Assafœtida *Lond.* The gum resin exuding from the sliced root of Narthex Assafœtida; Lin. Syst., Pentandria trigynia; a native of Persia, Affghanistan, and the Punjaub.

Description. Generally in masses of agglutinated tears, sometimes in separate tears. Masses, when cut, are amygdaloid in appearance, consisting of the harder whitish tear with softer and brownish-red uniting matter; it becomes pink, then dark red on exposure; odour very strong, and alliaceous, taste bitter and rather acrid; contains *volatile oil* ($C_{12} H_{11} S + C_{12} H_{11} S_2$) $\frac{4}{100}$, *resin* $\frac{65}{100}$, *gum* $\frac{25}{100}$ and some saline matters. When rubbed with water the gummy matters dissolve, the resin and volatile oil are suspended, and hence an emulsion is formed.

Off. Prep. ASSAFŒTIDA PRÆPARATA, LOND. Prepared Assafœtida. (Prepared as Ammoniacum præparatum.)

ENEMA ASSAFŒTIDÆ, LOND. Enema of Assafœtida. (Prepared assafœtida ʒj; decoction of barley Oß. Rub the assa-

fœtida with the decoction, gradually added, until they are thoroughly mixed.)

Tinctura Assafœtidæ, Lond. Tincture of Assafœtida. (Assafœtida, broken into fragments, ℥v; rectified spirit Oij. Macerate for seven days, and strain.)

It is contained also in Spiritus Ammon. Fœtid. and Pil. Galban. C.

Therapeutics. Assafœtida acts on the nervous system as a standard and powerful antispasmodic, especially useful in the hysterical convulsive affections; also in pertussis, asthma, and other nervous diseases; also in tympanitis as an enema. It is useful also in some forms of chronic bronchitis, from the expectorant powers it possesses.

Dose. Of the gum resin, gr. v to ℥ß or more; of the tinctura, f.ʒß to f.ʒj or more.

Adulteration. Mechanical impurities, as sand, stones, &c. occasionally met with.

Galbanum *Lond.* The gum resin of Galbanum Officinale. Some doubt, however, exists as to its true origin. It comes from the Levant and India.

Description. In masses, or more rarely in separate tears. Harder, lighter coloured, of less intense odour, and more agreeable than assafœtida.

Prop. & Comp. Galbanum contains less *volatile* oil than assafœtida. The *resin* has the composition (C_{40} H_{27} O_7). The volatile oil contains sulphur.

Off. Prep. Galbanum Præparatum, Lond. Prepared Galbanum. (Prepare this in the same manner as directed for Ammoniacum præparatum.)

Emplastrum Galbani, Lond. Galbanum Plaster. (Prepared galbanum ℥viij; plaster of lead ℔iij; turpentine ℥j; prepared frankincense ℥iij. To the galbanum and turpentine, melted together, first add the frankincense, then the plaster of lead, melted with a slow fire, and mix.)

Pilula Galbani Composita, Lond. Compound Galbanum Pill. (Prepared galbanum ʒij; myrrh, prepared, sagapenum, each ʒiij; prepared assafœtida ʒj; soft soap ʒij; treacle, as much as may be necessary. Beat them together, to form a mass.)

Therapeutics. The same as assafœtida, but less powerful. Externally it is used to indolent tumours, with an idea of its possessing discutient powers.

Dose. Of the gum resin, gr. x to ℈ß or more; of pil. galban. c., gr. x upwards.

Sagapenum *Lond.* The gum resin from an unknown plant, belonging to the order Umbelliferæ: it is imported from the Levant.

Description. In tears or masses, generally the latter; more yellow than assafœtida; in odour it much resembles that drug.

Prop. & Comp. As assafœtida.

Off. Prep. SAGAPENUM PRÆPARATUM, LOND. Prepared Sagapenum. (Prepare this in the same manner as ordered for Ammoniacum præparatum.)

It forms a part of Pil. Galban. C.

Therapeutics & Doses. As assafœtida.

OPOPONAX, formerly in the London Pharmacopœia: a gum resin in tears, obtained from Opoponax Chironium. Its properties are the same as those of the other fœtid gum-resins.

Ammoniacum *Lond.* The gum resin flowing from the stem and pedicel of Dorema Ammoniacum, indurated by the air; Lin. Syst., Pentandria digynia; growing in Persia. Stated to exude from punctures in the plant made by beetles.

Description. In separate tears, occasionally in masses; very white, becoming yellow; brittle when cold; odour slight but peculiar; taste bitter and rather acrid.

Prop. & Comp. *Resin* about $\frac{70}{100}$, *gum* $\frac{20}{100}$, *volatile oil* $\frac{4}{100}$. When rubbed with water the resin and oil are suspended by the dissolved gum.

Off. Prep. AMMONIACUM PRÆPARATUM, LOND. Prepared Ammoniacum. (Ammoniacum, in small lumps, ℔j; water, as much as may be necessary to cover the ammoniacum. Boil the ammoniacum with the water until they are mixed: strain the mixture through a hair-sieve, and evaporate it in a water-bath, stirring constantly that it may be hard when cold.)

EMPLASTRUM AMMONIACUM, LOND. Ammoniacum Plaster. (Prepared ammoniacum ℥v; diluted acetic acid, f.℥viij. Dissolve the ammoniacum in the acid; then evaporate the liquor over a slow fire, constantly stirring, to a proper consistence.)

EMPLASTRUM AMMONIACUM CUM HYDRARGYRO, LOND. Ammoniacum Plaster with Mercury. (Prepared ammoniacum ℔j; mercury ℥iij; olive oil, f.ʒj; sulphur, gr.viij. To the heated

oil add the sulphur gradually, stirring constantly with a spatula until they incorporate; then rub the mercury with them until globules are no longer visible. Lastly, gradually add the ammoniacum, melted, and mix them all.)

MISTURA AMMONIACI, LOND. Ammoniacum Mixture. (Prepared ammoniacum ʒv; distilled water Oj. Rub the ammoniacum with the water, gradually poured in, until they are perfectly mixed.)

Ammoniacum is contained also in Pil. Scillæ C., and in Pil. Ipecac. c. Scillâ.

Therapeutics. Less antispasmodic than the other gum resins, but it seems more expectorant; used chiefly in chronic bronchitic affections. Externally, as a stimulant discutient over indolent tumours, &c.

Dose. Of the gum resin, gr. x to ʒß or more; of the mixture, f.℥j to f.℥jß.

Anisum *Lond.* The fruit of Pimpinella Anisum, or Anise; Lin. Syst., Pentandria digynia; growing in Egypt and Syria, but cultivated in Europe.

Anisi Oleum *Lond.* The oil distilled from the fruit.

Description. The mericarps, commonly called seeds, are oblong-ovate, downy, have five primary ridges, three vittæ in each channel; of a dingy, yellowish-green colour.

Prop. & Comp. The *volatile oil,* Oleum Anisi, upon which the activity of the mericarp depends, is of a light straw colour; sp. gr. from 0·977 to 0·99: it consists of two portions, one heavier than water, and solid at ordinary temperatures; the other liquid, and more volatile; the former called Stearoptene, the latter Eleoptene; both have same composition. Formula ($C_{10}H_6O$).

Off. Prep. Of the oil. SPIRITUS ANISI, LOND. Spirit of Aniseed. (Oil of aniseed, f. ʒiij; proof spirit, a gallon. Dissolve.)

Therapeutics. Stimulant, aromatic, and carminative; used to relieve flatulence, and to diminish the griping of purgative medicines.

Dose. Gr. x to ℈j, in powder; of the oil, gtt. ij to gtt. x.

Fœniculum *Lond.* The fruit of Fœniculum dulce, Fennel; Lin. Syst., Pentandria digynia; grows in most parts of Europe.

Fœniculi Oleum. The oil distilled from the fruit.

Description. The mericarps are oblong, convex on one surface, flat on the other; many of the mericarps are connected together by their flat surfaces, some single, of a dark grayish colour; footstalk often attached. The oil is of a light yellow colour, with the characteristic odour of the seeds.

Prop. & Comp. The oil, which is the active ingredient, is of sp. gr. 0·99; it consists of two parts, one more volatile than the other; the more solid one named Stearoptene, the other Eleoptene.

Therapeutics. Action the same as Anise.

Dose. Of oleum fœniculi, gtt. v to gtt. x.

Cyminum *Lond.* The fruit of Cuminum Cyminum, or Cumin; Lin. Syst., Pentandria Digynia; native of Egypt, but cultivated in Malta, Sicily, and other parts of Europe.

Description. These mericarps are somewhat larger than the carraway, concavo-convex, with five primary and four secondary ridges; four vittæ under the latter, *i.e.*, one under each; odour, peculiar; taste, warm.

Prop. & Comp. Their properties depend on the presence of a *volatile oil,* which is of a yellow colour, and lighter than water.

Off. Prep. Emplastrum Cumini. Plaster of Cumin. (Cumin carraway, bayberries, each ℥iij; prepared burgundy pitch, ℔iij; wax, ℥iij; olive oil, water, each f.℥iſs. Melt the pitch and wax together, add the dry constituents rubbed to powder, then the oil and water, and evaporate to a proper consistence.)

Therapeutics. Action the same as that of the other carminative fruits. Emplastrum Cumini, a stimulant plaster, is now reintroduced by the London College after a long absence from the Pharmacopœia.

Coriandrum *Lond.* The fruit of Coriandrum sativum, Coriander seeds; Lin. Syst., Pentandria Digynia; native of Italy, naturalised in most parts of Europe.

Description. Fruit of a globular form, consisting of two carpels, adherent together, but which readily separate; odour, aromatic; colour, dark straw.

Prop. & Comp. Contains a *volatile oil.*

Off. Prep. It is an ingredient in Confect. Sennæ.

Therapeutics. Aromatic, carminative; rarely given alone.

Dose. From ℈ij to ℥j.

Carui *Lond.* The fruit of Carum carui, or Carraway; Lin. Syst., Pentandria Digynia; indigenous.

Carui Oleum *Lond.* The oil distilled from the fruit.

Description. The carraway seeds (mericarps) are slightly curved with fine filiform ridges; a single vitta in each channel. The longitudinal ridges of a lighter colour than the intervening interstices. Colour, brownish, with a peculiar aromatic odour and warm taste. The oil is of a pale yellow colour, with the odour of the fruit.

Prop. & Comp. The fruit, besides the common constituents of a mericarp, yields a *volatile oil,* on the presence of which its medicinal virtues depend. The sp. gr. of the oil is 0·946; its colour is darkened by long keeping. It contains carbon, hydrogen, and oxygen.

Off. Prep. Spiritus Carui, Lond. Spirit of Carraway. (Oil of carraway, f. ʒij; proof spirit, a gallon. Dissolve.)

Aqua Carui, Lond. Carraway Water. (Prepare this as directed for dill water.)

It is contained in some other officinal preparations.

Therapeutics. Carraway is an aromatic, stomachic, and carminative, often used as a corrector of flatulence, and as an adjunct to other medicines; the oil is often added to purgative medicines to prevent griping.

Dose. Of the aqua carui, ℥j to ℥ij; of the oleum carui, gtt. ij to gtt. xij.

Anethum *Lond.* Fruit of Anethum graveolens, or Dill; Lin. Syst., Pentandria Digynia; native of South of Europe.

Anethi Oleum *Lond.* Oil distilled from the fruit.

Description. The seeds (fruit) are of brown colour, convex on one side, and concave on the other; five primary ridges, and one vitta in each channel. Pale membranous alæ. The oil is of a pale yellow colour, and aromatic odour.

Prop. & Comp. The dill owes its peculiar properties to the *volatile oil.* This oil resembles in appearance that of carraway; its sp. gr. is 0·881.

Off. Prep. Aqua Anethi, Lond. Dill water. (Bruised dill,

℔jss ; water, two gallons ; let a gallon distil : or oil of dill, f.ʒij ; powdered silex, ʒij ; distilled water, a gallon. Rub well first the oil with the silex, then with the water, and strain the solution.)

Therapeutics. Carminative, as carraway ; chiefly used in the flatulence of infants.

Dose. Of the aqua anethi, f.℥j to f.℥ij ; of oleum anethi, gtt. ij to gtt. x.

Carota *Lond.* Recent root of the Daucus Carota (var. sativa), Carrot ; Lin. Syst., Pentandria Digynia ; cultivated in the gardens of this country.

Description. This root is too familiar to need description.

Prop. & Comp. It contains, besides a little volatile oil, albumen, salts, &c., a crystallisable substance *Carotine*, neutral, of fine red colour ; also *Pectin*, the gelatine of the vegetable kingdom.

Off. Prep. None.

Therapeutics. It is used as a cataplasm to correct the fœtor of phagedenic ulcers. It acts probably as a slight stimulant when applied in the fresh state to an ulcerated surface.

Sumbul. Musk Root. Supposed to be the root of an umbelliferous plant, but the plant itself is unknown ; it is said to grow in the north and eastern parts of India. It comes through Russia and Bombay.

Description. The drug as obtained in this country is in circular pieces, consisting of transverse sections of the root three or four inches in diameter. The epidermis of light brown colour, wrinkled ; the inner substance consists of coarse irregular fibres, easily separated ; on looking at a transverse section, it appears porous through the greater part of its diameter, and the bundles of fibres are loosely packed together. The odour is strong and musk-like, hence its name.

Prop. & Comp. It yields, on distillation, a volatile oil, *resin*, starch, and an acid capable of crystallisation, named Sumbulic acid.

Off. Prep. It is given in substance, in powder, or pills ; also as an infusion or tincture, either alcoholic or ethereal.

Therapeutics. It appears to be a nervine stimulant, similar in its action to valerian. In Russia it has been used in cholera, and febrile diseases of a typhoid or adynamic type. It has been

recommended in epilepsy, chorea, and other nervous disorders, and its use is said to be attended with much benefit in cases of delirium tremens. Its action requires further investigation.

Dose. From ℈j to ʒj, or more.

CAPRIFOLIACEÆ.

Sambucus *Lond.* The recent flower of Sambucus niger, Elder Flower; Lin. Syst., Pentandria Trigynia; indigenous.

Description. The flowers are small, white, having a peculiar odour, in five-parted cymes.

Prop. & Comp. They yield on distillation a *volatile oil,* to the presence of which they owe their odour. Their active ingredients are soluble in water; no peculiar crystallisable principle has been obtained from them; they contain ingredients common to most flowers.

Off. Prep. Aqua Sambuci, Lond. Elder-Flower Water. (Elder flowers ℔x; water, two gallons. Let a gallon distil.)

Unguentum Sambuci, Lond. Ointment of Elder. (Elder flowers, lard, of each, ℔j. Boil the elder flowers in the lard until they become crisp, then pass through a linen cloth.)

Therapeutics. The flowers are gently stimulant in their action, and are chiefly used as a topical application. The inner bark of the elder tree possesses hydragogue and cathartic powers, and has been used with success to remove the fluid in dropsies. It may be given in the form of decoction, the strength being about 4 oz. to the pint; of this, two to four ounces may be given as a dose.

CINCHONACEÆ.

Cinchona flava *Lond.* Yellow Bark, from Cinchona Calisaya.

Cinchona pallida *Lond.* Pale or Crown Bark, from Cinchona Condaminea.

Cinchona rubra *Lond.* Red Bark, from unknown species of Cinchona.

Cinchona cinerea *Edin. Dub.* Gray or Silver Bark, from Cinchona micrantha.

Quinæ Disulphas *Lond.* Disulphate of Quina. A crystal-

line salt, prepared from the bark of Cinchona flava (Calisaya).

The different species of Cinchona belong in the Linnæan system, to Pentandria Monogynia, and inhabit the Andes, chiefly on the eastern face of the Cordilleras, from 4000 to 12000 feet above the sea, and extending from 10° of North latitude to 20° of South latitude, growing therefore in Peru, Bolivia, and Columbia. The finest barks are obtained from trees growing in the coolest climates and on rocky soils; the temperature varies from about 59° to 62° Fah.

Description. Until very recently great doubt existed as to the origin of the different kinds of cinchona barks, but the recent researches of Weddell have thrown much light upon the subject; still the tree or trees from which red bark is obtained is involved in mystery.

Cinchona flava, or true yellow bark, which has been shown by Weddell to be obtained from Cinchona calisaya (two varieties C. vera and C. Josephiana, the latter a shrub), occurs in two forms, in quills or flat pieces; the former are from 4 to 18 inches in length, and from $\frac{1}{4}$ to 2 or 3 inches in diameter, with a thickness varying from $\frac{1}{8}$ to $\frac{1}{3}$ inch. The quills are generally single, and the bark is covered with a brown epidermis, mottled with white or yellowish lichens, and marked with longitudinal wrinkles and transverse or circular fissures. The latter, or flat pieces, are more fibrous, denuded of the epidermis, and of a cinnamon colour; both are very bitter in taste, and break with a fibrous fracture and the escape of a powder. Yellow barks of inferior quality are found, called Carthagena barks, Cusco barks, &c., produced by Cinchona cordifolia, Cinchona lancifolia, and other species. The London College states that one pound of yellow bark should yield about 180 grains of disulphate of *quina* when treated with sulphuric acid.

Cinchona pallida, pale Crown or Loxa bark, the produce of Cinchona Condaminea; always occurs in quills, which are single or double, from 6 to 18 inches in length, from $\frac{1}{4}$ to $\frac{3}{4}$ inch in diameter, and from $\frac{1}{25}$ to $\frac{1}{6}$ inch in thickness; it is marked with longitudinal wrinkles, and transverse or circular cracks; the epidermis brown or grey, and frequently covered with crustaceous and stringy lichens; the inner surface cinnamon-brown in colour, and smooth: the taste is bitter and astringent; the fracture short and not fibrous, except in the larger pieces: the medium-sized quills are most esteemed. Pale bark yields *cinchonia* chiefly.

Cinchona rubra, red bark, from as yet unknown species of cinchona; occurs in quills or flattened pieces, more frequently

the latter; covered with a brownish-red epidermis, sometimes with lichens; occasionally strongly tuberculated on the surface, thus called warty; internally rough, fibrous, and of a dark-red chestnut colour: the taste is very bitter, the fracture fibrous and splintery: the bark varies from about 6 to 18 inches in length, and the flattened pieces are sometimes 4 or 5 inches broad, and ½ inch or more in thickness. Red bark yields quina and cinchonia in about equal quantities.

Cinchona cinerea, silver, gray, or Huanuco bark, the produce of Cinchona micrantha and Cinchona nitida, is found in quills, which are in general larger and coarser than those of crown bark; with a greyish epidermis, less wrinkled longitudinally, and less completely cracked transversely; the smaller quills are often twisted spirally; and on the inner surface the bark is more uneven, and of a redder colour than Loxa or Crown bark.

For the description of other Cinchona barks used in commerce for the extraction of the alkaloids, the reader is referred to more extended works on the subject, especially to the article Cinchona, the last effort of the late Dr. Pereira.

Prop. & Comp. The different barks are closely allied to each other in composition: they all contain acid and alkaline principles peculiar to the genus Cinchona, together with other matters common to many kinds of barks; the most important are as follow:

Kinic Acid ($C_7 H_4 O_4 + 2 H O$) can be crystallised in rhombic prisms, resembling tartaric acid in appearance; soluble in water, and sour in taste; it is sometimes called Cinchonic or Quinic acid; it yields a yellow, crystallisable, pungent, sublimate *Kinone* ($C_{12} H_4 O_4$) when distilled with some oxidising agents.

Cincho-tannic Acid ($C_{14} H_6 O_7 + 2 H O$) differs from ordinary tannin or tannic acid, in precipitating the persalts of iron green, and rapidly absorbing oxygen, especially when united with an alkali.

Red Cinchonic ($C_{12} H_7 O_7$), supposed to be produced by the oxidation of cincho-tannic acid; a red substance, hence the name; almost insoluble in water, but soluble in alcohol, ether, alkalies, and acids: the solutions have a deep-red colour.

Kinovic Acid ($C_{12} H_9 O_3$), found in many kinds of barks; in its chemical characters it somewhat resembles stearic acid; its solutions precipitate copper green, a reaction employed as a test of its presence.

Quina or *Quinine* ($C_{38} H_{22} N_2 O_4$ or $C_{20} H_{12} N O_2$), the most important alkaloid contained in the barks, exists in the largest quantities in Calisaya bark; when pure, it is white,

crystallising with great difficulty as a hydrate; soluble in about 400 parts of cold water, 60 parts of ether, and very soluble in alcohol; fusible, forming a resinous mass; forms salts with acids, and its solutions exhibit a fluorescent appearance, and when treated with excess of chlorine water, and ammonia afterwards added, a dark, emerald-green liquid is produced. Quina forms crystallisable salts with acids, some having one, some two atoms of base (taking the smaller equivalent of quina); the best known is the officinal salt, Quinæ disulphas or disulphate of Quinine.

Cinchonia or *Cinchonine* ($C_{38} H_{22} N_2 O_2$ or $C_{20} H_{12} NO$), the second alkaloid, contained chiefly in the pale varieties of bark, white, and readily crystallises from its alcoholic solution in brilliant four-sided prisms; almost insoluble in water and ether, and requiring about thirty parts of rectified spirit to dissolve it; unites with acid, and forms soluble salts, the solution of which are not fluorescent, and do not give the green colour with chlorine and ammonia, but merely become light yellow. Cinchonia forms neutral and disalts.

Quinidina or *Quinidine* ($C_{36} H_{22} N_2 O_2$), a third alkaloid, contained in most of the cinchona barks; occurs, when pure, in white prisms, readily crystallising from alcohol, and also when precipitated from the watery solutions of its salts, by means of an alkali; it is very bitter, but less intensely so than quina, and its solutions are fluorescent: in its power of dissolving in water or alcohol, it is intermediate between quina and cinchonia, and its disulphate is also much more soluble than that of quina, much less so than that of cinchonia. The solutions of quinidina, when treated with chlorine water and ammonia, do not show the emerald-green appearance.

Very recently it has been supposed that the so-called quinidina may not be simple, but a compound of two alkaloids, one or other of which may be in excess, and even sometimes form the whole of the substance. M. Pasteur, from an examination of the alkaloids of cinchona barks, has come to the following conclusions, which, if established, will clear up much before doubtful on the subject. He considers that four distinct alkaloids exist in cinchona barks, *quinine*, *quinidine*, *cinchonine*, and *cinchonidine*; he also states that *quinine*, by being carefully heated in the form of a salt, as the tartrate, is changed into an isomeric body, *quinicine*, and *cinchonine*, under like circumstances, into *cinchonicine*, substances similar to them, but amorphous; and he also finds that *quinidine* and *cinchonidine* are converted into the same isomeric substances, *quinicine* and *cinchonicine*. According to Pasteur, *quinine* and *quinidine*

strike green with chlorine and ammonia, but *cinchonine* or *cinchonidine* do not, and that the alkaloids usually designated *quinidine* commonly consist chiefly of *cinchonidine.*

An alkaloid *Aricina* ($C_{20}H_{12}NO_3$?) was found by Pelletier in Arica bark; it has not, however, been rediscovered, and some doubts exist with regard to it. Guibourt has obtained cinchonia, not aricina, from the same bark.

The substance known by the name of *quinoidine* consists of resinous and colouring matters, with the above alkaloids more or less changed by the processes they have been subjected to; it is obtained from the liquors from which the disulphate of quina has been crystallised; it was from this substance that Liebig obtained his *amorphous quinine,* which may, perhaps, be the *quinicine* of Pasteur.

The salts of the cinchona alkaloids commonly used in medicine, are as follow:—

QUINÆ DISULPHAS, or the Disulphate of Quinine (formula $C_{38}H_{22}N_2O_4. HO, SO_3 + 7HO$), in snow-white feathery crystals, requiring for solution about 60 parts of strong spirit, and 750 parts of water; and the watery solution, treated with chlorine, and ammonia, gives the green test before noticed, and also exhibits fluorescence; it has all the characters of a neutral salt.

CINCHONIÆ DISULPHAS, or Disulphate of Cinchonia ($C_{38}H_{22}N_2O_2, HO, SO_3 + 2HO$), occurs in prisms, often of considerable size, requiring for solution about 6 parts of strong spirit and 54 parts of water: the solution is not fluorescent, and does not give the test with chlorine and ammonia.

QUINIDINÆ DISULPHAS, or Disulphate of Quinidine ($C_{38}H_{22}N_2O_2, HO, SO_3 + 6HO$), in acicular shining crystals, requiring 2 parts of spirit and 130 parts of water for solution; the solution is not fluorescent, and does not give the green colour with chlorine and ammonia.

Besides the above, the VALERIANATE OF QUINA, described under Valerian; the CITRATE OF IRON AND QUININE, a salt in which quinine replaces the ammonia of the ammonio-citrate, and which should contain about 12 per cent. of the alkaloid; also an ARSENITE OF QUININE, are occasionally employed in medicine, but the special value of which is somewhat doubtful. The above alkaloids also form with acids what are named neutral, but in reality acid salts, and when the ordinary sulphates are administered, dissolved in excess of their acid, as they usually are, such salts are produced. *Tartrates, Phosphates, Citrates, Tannates,* and various other compounds, have been occasionally proposed as medicines.

Off. Prep. Of the Barks, DECOCTUM CINCHONÆ, LOND. Decoc-

tion of (Yellow) Bark. (Yellow bark, bruised, ℥x; distilled water, Oj. Boil for ten minutes in a lightly covered vessel, and strain the liquor while hot.)

Decoctum Cinchonæ Pallidæ, Lond. Decoction of Pale Bark. (Prepare this in the same way as directed for Decoction of Cinchona.)

Decoctum Cinchonæ Rubræ, Lond. Decoction of Red Bark. (Prepare this in the same manner as directed for Decoction of Cinchona.)

Extractum Cinchonæ, Lond. Extract of (Yellow) Bark. (Yellow cinchona, coarsely bruised, ℔iij; distilled water, Ovj. Add four pints of water to the cinchona, and stir constantly with a spatula until the bark has become soaked; macerate for twenty-four hours, and strain through linen. Macerate that which remains in the rest of the water for twenty-four hours, and strain; then evaporate the mixed liquors to a proper consistence.)

Extractum Cinchonæ Pallidæ, Lond. Extract of Pale Bark. (Prepare this in the same manner as directed under Extract of Cinchona Bark.)

Extractum Cinchonæ Rubræ, Lond. Extract of Red Bark. (Prepare this in the same way as directed for Extract of Cinchona.)

Infusum Cinchonæ, Lond. Infusion of (Yellow) Bark. (Yellow cinchona bark, bruised, ℥j; boiling distilled water, Oj. Macerate for two hours in a covered vessel, and strain.)

Infusum Cinchonæ Spissatum, Lond. Concentrated Infusion of (Yellow) Bark. (Yellow cinchona bark, coarsely bruised, ℔iij; distilled water, Ovj; rectified spirit, as much as may be necessary. Macerate the cinchona in the same manner as directed under Extract of Cinchona, and strain. Evaporate the mixed infusions, to a fourth part, in a water-bath, and set aside that the dregs may settle. Pour off the clear liquor, and strain the remainder; then mix, and again evaporate until the sp. gr. of the liquor be 1·200; to this, when cooled, drop in the spirit by degrees, so that three fluid drachms may be added to each fluid ounce of the liquor. Lastly, set aside the liquor for twenty days, that the dregs may entirely subside.)

Infusum Cinchonæ Pallidæ, Lond. Infusion of Pale Bark. (Prepare this as directed for Infusion of Cinchona.)

Infusum Cinchonæ Pallidæ Spissatum, Lond. Concentrated Infusion of Pale Bark. (Prepare this as directed for Concentrated Infusion of Cinchona.)

Tinctura Cinchonæ, Lond. Tincture of (Yellow) Bark.

(Yellow cinchona, bruised, ℥viij; proof spirit, Oij. Macerate for seven days, then press and strain.)

TINCTURA CINCHONÆ PALLIDÆ, LOND. Tincture of Pale Bark. (Prepare this in the same manner as has been directed for Tincture of Cinchona.)

TINCTURA CINCHONÆ COMPOSITÆ, LOND. Compound Tincture of (Pale) Bark. (Pale cinchona, bruised, ℥iv; rind of orange, dried, ℥iij; serpentary, bruised, ʒvj; saffron ʒij; cochineal, bruised, ʒj; proof spirit, Oij. Macerate for seven days, then press and strain.)

Of Quina. TINCTURA QUINÆ COMPOSITA, LOND. Compound Tincture of Quinine. (Disulphate of quinine, ʒv ℈j; tincture of orange, Oij. Digest for seven days, or until the quinine is dissolved, and strain.)

Therapeutics. Cinchona barks owe their efficacy chiefly to the alkaloids contained in them, but an influence is also derived from the cincho-tannic acid and red cinchonic, which produce a slight difference of action between the barks and the alkaloids derived from them. Given in small doses, bark causes an increase of appetite, especially in weak patients, and at the same time improves the condition of the muscular and nervous systems; hence the improvement of the blood and general health; it may, therefore, be well designated a tonic. Its power in bracing up the system is also seen in the check given to the colliquative sweating occurring in extreme debility. Bark also produces a peculiar influence upon the nervous system, which is exhibited in the extraordinary power which it possesses of arresting the progress of certain diseases, characterised by a periodical recurrence of their symptoms, as ague, the different forms of neuralgia, and certain inflammatory affections: how this effect is produced is at present unknown. Bark acts also as an astringent, and this property, combined with the tonic and anteperiodic powers, is often of much therapeutic value.

In large doses bark causes disagreeable, sometimes even serious symptoms, as thirst, loss of appetite, nausea, and even vomiting, headache, throbbings in the head, noise in ears, and occasionally deafness and coma.

Bark may be advantageously employed in many diseases.

In *atonic dyspepsia,* as a stomachic, is most valuable in cases where the indigestion results from a want of tone in the general system, such as occasionally occurs in the convalescence from acute diseases. also in some forms of gastrodynia of a neuralgic and intermittent character.

In *atonic conditions of the general system,* as a tonic, to

improve the tone of the muscles, check too great perspiration and abnormal mucous discharges if present: it is useful also in *scrofula* and other forms of *cachexia*, and in *gangrene* arising from want of tone in the habit; also in some low forms of *chronic inflammation*.

It is, however, in *intermittent fevers* that its efficacy is most strongly marked, and perhaps no remedy in the list of the Materia Medica has obtained such repute in the treatment of these fevers. Bark may be given in two ways; either in a very large dose, a short time before the expected paroxysm, or in small doses, frequently continued, during the whole of the interval between the paroxysms: sometimes the first method is at once effectual, but there is some fear of producing unpleasant symptoms from the amount of the dose; the second method is also, as a rule, quite successful, and without hazard.

Bark has been found useful in all the different varieties of quotidian, tertian and quartan *agues*, and also in the *remittent fevers* occurring in hot and damp climates, as on some parts of the coasts of Africa, &c. In *continued fevers* its value is somewhat questionable.

Externally bark acts as an astringent and antiseptic: it is often made use of as an application to unhealthy ulcers, sprinkled in the form of powder on the part, also in the form of gargle in putrid sore throats, and applied to spongy gums, as a dentifrice.

Action of Cinchona Acids.

Cinchotannic acid and *Red Cinchonic* produce astringent effects upon the system.

The action of *Kinic* and *Kinovic* acids is unknown.

Action of the Cinchona Alkaloids.

Quina, or any salt of this alkaloid, produces all the effects of yellow cinchona bark, except that it is not astringent; it may be given in all cases where bark is indicated—generally with some advantage over bark itself, on account of the smallness of the dose required, and its little liability to disturb the stomach: the only exceptions would be, cases of great debility of the system, with excessive weakness of the circulation and increased secretions; in these the Galenical preparations of cinchona barks appear at times to be preferable.

Cinchonia is generally supposed to have a similar action to quina, differing only in degree, and regarded as much weaker: that it possesses antiperiodic powers is undoubted, whether equal to quina, or not, requires still to be determined. The

author has had abundant evidence to prove that peculiar effects often result from cinchonia salts, which are not produced by the same amount of the corresponding salts of quina.

Quinidina appears to act in the same way as quina, but whether equal in power has not been yet determined.

Action of the different kinds of Cinchona Barks.

No very well marked difference in the action of the different barks has yet been established: there can be no doubt, however, that their effects depend on the alkaloids contained in them, and consequently any peculiarity of the bark would be that of the prevailing alkaloid.

As a rule, quina exists in large quantities in yellow bark, cinchona in pale barks, and the red variety is stated to contain about equal amounts of the two alkaloids. According to results of recent examinations, collected in the form of a table by the late Dr. Pereira,

Yellow or Calisaya barks yield from $\frac{25}{1000}$ to $\frac{38}{1000}$ of quinine;

Pale or Loxa barks, from about $\frac{7}{1000}$ to $\frac{14}{1000}$ of alkaloids, chiefly cinchonine or quinidine, with a little quinine;

Best red barks, $\frac{26}{1000}$ of quinine, and $\frac{15}{1000}$ of cinchonine;

Gray or Huanuco barks, from $\frac{17}{1000}$ to $\frac{21}{1000}$ alkaloids, chiefly consisting of cinchonine and quinidine, with occasionally some quinine.

Dose. Of any cinchona bark, in powder, gr.x to ʒj; of the decoctions, f.℥j to f.℥ij; of the extracts, gr.v to ʒss; of the infusions, f.℥j to f.℥ij; of the inspissated infusions, ♏xx to f.ʒj; of the tinctures (simple or compound), f.ʒj to f.ʒij; of disulphate of quinine, gr.j to gr. x, or even ℈j; of compound tincture of quinine, ʒj to ʒij; of disulphate of cinchonine, gr.j to ℈j; of disulphate of quinidine, gr.j to ℈j.

In intermittents, or when the dose of bark is required to be large, the salts of quina or cinchonia are preferred; powdered bark was formerly given in such cases, but is apt to disagree with the stomach, causing nausea and vomiting: the inspissated infusions might be made use of, but their strength is by no means equivalent to the amount of bark made use of in their preparation, and the same holds good of all the Galenical preparations made with water, the solvent powers of that fluid being unequal to abstract all the principles from the bark.

Adulteration of Cinchona Barks. Inferior non-officinal cinchona barks may be substituted for the officinal, and barks of other species may be sold for those of the genus Cinchona: these are distinguished by their physical characters, and by finding

the presence and amount of the cinchona alkaloids contained in them. The structure of the bark affords some test of its value, for it has been found that the bark, which exhibits when fractured a homogeneous texture, with a large amount of short fusiform ligneous fibres, uniformly distributed in the cellular tissue, contains a large amount of quinine: this is the character of true Calisaya barks. Barks rich in quinine generally contain much lime, and the strong infusions are precipitated by sulphate of soda; which is not the case with the barks yielding cinchonine. The same holds good with regard to the amount of tannin. Many methods of ascertaining the per-centage of alkaloids have been proposed; a simple and apparently correct one is that of M. Rabourdin:—Take a given quantity, say 250 grains, of the bark, exhaust it thoroughly by boiling in water acidulated with hydrochloric acid; then render the filtered solution alkaline by the addition of caustic potash, and shake the whole with about f. ℥ß of chloroform for a few minutes; the chloroform should remove the whole of the bitterness from the solution; if the supernatant fluid is removed, the chloroform washed with a little water, and the washings decanted off, the alkaloids will be left after evaporation. The different alkaloids can be separated from each other by ether.

Of Disulphate of Quinine. On account of the high price of this salt, many adulterations have been practised. *Disulphates of cinchonine* and *quinidine, salicine, sugar of milk, cane sugar, mannite, starch,* and *stearic acid,* form the most frequent organic adulterations; and *sulphate of lime,* precipitated to imitate the quina salt, *chalk, magnesia,* and *boracic acid,* are among the most frequent inorganic additions. These latter are readily detected by not dissolving in alcohol, with the exception of boracic acid, and by heating the suspected salt on a piece of platinum foil, where they remain as an ash, the nature of which can be ascertained by various tests for these substances: the organic impurities are more difficult of detection; cinchonine and quinidine can be discovered by the different solubilities in water, alcohol, and ether; salicine, by the blood-red colour produced by sulphuric acid; the sugars, by the solution of the salt, after the precipitation of the alkaloids by means of an alkali, being sweet; starch, by striking blue with iodine; and stearic acid, by not dissolving in dilute acids. Boracic acid, if present, gives to its alcoholic solution the property of imparting a green tinge to flame. The London College gives a quantitative test, which, however, only refers to the amount of sulphuric acid, viz., that 100 grains should yield, with chloride of barium, 26·6 grains of dry sulphate of baryta.

Ipecacuanha *Lond.* The root Cephaelis Ipecacuanha; Lin. Syst., Pentandria Monogynia; growing chiefly in the Brazils, and sent from Rio Janeiro.

Description. *Annulated* or Brazilian Ipecacuanha, as it is named to distinguish it from another kind, called *Striated* or Peruvian Ipecacuanha, the produce of Psychotria emetica, is in the form of contorted pieces, from two to four inches in length, about the size of a small quill, knotted, having very deep circular fissures extending down to the woody axis, and giving the appearance of a series of ash-coloured rings, strung on a white cord. The odour of ipecacuanha is slight, but disagreeable; the taste bitter, aromatic, and slightly acrid: it breaks easily, with a resinous fracture.

Prop. & Comp. Ipecacuanha contains an alkaloid, *emetina* (C_{35} H_{25} NO_9), separable as a whitish amorphous powder, of a bitter taste, soluble in alcohol, sparingly so in water, and precipitated by tannin; also a peculiar acid, *cephaelic* or *ipecacuanha acid* (C_{14} H_8 O_6), allied to catachuic and kinic acids, formerly thought to be gallic acid, and striking green, with the persalts of iron; gum, starch, and waxy matter are also present in the root. Water, spirit, and wine take up the active part, namely, the salt of emetina.

Off. Prep. Pulvis Ipecacuanhæ Compositus, Lond. Compound Powder of Ipecacuanha. (Powdered ipecacuanha, powdered opium, each, ʒj; powdered sulphate of potash, ℥j. Mix.) One grain of opium and ipecacuanha are contained in ten grains of this powder.

Pilula Ipecacuanhæ cum Scillâ, Lond. Pill of Ipecacuanha with Squill. (Compound powder of ipecacuanha, ʒiij; squill, freshly powdered, ammoniacum, powdered, each, ʒj; treacle, as much as may be necessary. Beat all together, to form a mass.)

Vinum Ipecacuanhæ, Lond. Ipecacuanha Wine. (Ipecacuanha, bruised, ℥ijss; sherry wine, Oij. Macerate for seven days, and strain.)

Ipecacuanha is contained also in Pil. Conii Comp.

Therapeutics. Ipecacuanha in large medicinal doses acts as an emetic, not so speedy as sulphate of zinc or mustard; at the same time it is more depressing, less so, however, than tartar emetic: in smaller doses, short of inducing either nausea or vomiting, it becomes absorbed and acts upon the different mucous surfaces, especially of the respiratory passages and of the alimentary canal, and is, therefore, expectorant, and sometimes laxative; it also acts upon the skin as a diaphoretic. Ipecacuanha is well suited for an *emetic* in chest affections

accompanied with fever, as in bronchitis, phthisis, and croup, in which the after-expectorant effect is of great service; also to unload the stomach in dyspepsia when of an imflammatory character. As an *expectorant*, in the various forms of bronchitic disease, and on account of its action on the alimentary canal, it is of value in chronic dysentery and diarrhœa, for which it was at one time held in great estimation; it is also at times a useful adjunct to purgative medicines. As a *diaphoretic* it is frequently employed in catarrhal affections, especially when combined with opium, in the form of Dover's powder, which appears to increase its sudorific action.

Ipecacuanha has also been given in agues before the paroxysm, to prevent or cut it short; and, on account of the *sedative* effect on the vascular system which follows the nausea, in hæmorrhages of various kinds. Some individuals are peculiarly susceptible of the influence of ipecacuanha, the effluvia from the powdered drug being sufficient to cause sneezing, cough, and a species of asthma.

Dose. Of ipecacuanha (powdered), as an *emetic*, gr. xv to ʒß; as an *expectorant*, &c., gr. $\frac{1}{1}$ to gr. ij: of vinum ipecacuanhæ, as an *emetic*, f. ʒiij to f. ʒvj; as an *expectorant*, ♏v to ♏xl: of pil. ipecacuanhæ cum scillâ, gr. v to gr. x. The dose of pulv. ipecacuanhæ comp. depends on the amount of opium desirable to administer rather than on the ipecacuanha.

Adulteration. Striated ipecacuanha, above alluded to, and other roots, have occasionally been mixed with or substituted for ipecacuanha.

Caffeine, a principle obtained from coffee, or the berry of Caffea Arabica, a plant belonging to the order Cinchonaceæ, contained also in tea and Ilex Farguensis or Paraguay tea, Paulinia sorbilis, and other plants used by different nations to form beverages, has also been employed in medicine. When pure, *Caffeine* or *Theine* forms beautiful silky prisms, soluble in water, alcohol, and ether, precipitated by tannin, and sublimes when heated. Composition ($C_8 H_5 N_2 O_2$).

Given internally, Caffeine or a strong infusion containing it acts powerfully upon the nervous system, producing restlessness, palpitation of the heart, and other nervous symptoms. Caffeine also appears to possess the power of checking, in some measure, the changes or metamorphoses of the animal body, shown by the diminished formation of urea, which takes place under its employment. Coffee and Caffeine may be given to relieve

stupor from the use of opium or other narcotics, in nervous headachs, to arrest the paroxysms of spasmodic asthma, and in hooping-cough, also in some forms of intermittent affections. The action of Caffeine requires further investigation, as in the infusions of coffee and tea a part of the influence may be due to the other constituents which are present.

PALE CATECHU, described under *Catechu*, is derived from *Uncaria Gambia*, a tree belonging to this order.

VALERIANACEÆ.

Valeriana *Lond.* The root of Valeriana officinalis, the Wild Herb; Lin. Syst., Triandria Monogynia; indigenous.

Description. As met with, it consists of a short tuberose root, with numerous radicles; of a light brown colour, a strong characteristic and disagreeable odour, and acrid, camphoraceous, but nauseous taste.

Prop. & Comp. Valerian root owes its properties to a *volatile oil* and *valerianic acid*; resinous, extractive, and gummy matters are also present. Volatile oil of valerian, sp. gr. 0·94, has a light greenish colour, and the odour of valerian; it consists of *valerole* ($C_{12}\ H_{10}\ O_2$), a hydrocarbon *Bornéene* ($C_{10}\ H_8$), and a *camphor* ($C_{20}\ H_{18}\ O_2$), isomeric with Borneo camphor: the valerole by exposure oxidates, and is converted into the peculiar acid which is contained in the root.

Valerianic acid ($C_{10}\ H_9\ O_3+HO$) can be procured in small quantities from the root by distillation with very dilute sulphuric acid; it forms an oily liquid, sp. gr. 0·9, with the intense odour of valerian; forms salts with the metallic bases, most of them crystalline. This acid can also be formed, and much more economically, by oxidating Fusel oil or amylic alcohol ($C_{10}\ H_{11}\ O+HO$), obtained during the latter part of the process of obtaining spirit from corn or potatoes, by means of bichromate of potash and oil of vitriol; valerianic acid standing in the same relation to amylic alcohol as acetic acid to common alcohol. Some valerianates are used in medicine.

Valerianate of Zinc ($C_{10}\ H_9\ O_3+Zn\ O$) occurs in pearly crystalline scales, with strong odour and taste; soluble in alcohol, sparingly so in cold water.

Valerianate of Quina ($C_{10}\ H_9\ O_3+Qn+2\ HO$) forms white silky needles, of strong odour and taste; soluble in alcohol, and sparingly so in water, especially when cold; is decomposed by heat with escape of valerianic acid. These two salts are officinal

in the Dublin Pharmacopœia, and processes are given to form them from the valerianate of soda, which is directed to be made from fusel oil or amylic alcohol.

Valerianate of Iron is sometimes made; it occurs as a brownish-red powder.

Off. Prep. INFUSUM VALERIANÆ, LOND. Infusion of Valerian. (Valerian ℥ß; boiling distilled water Oj. Macerate for half an hour in a closed vessel, and strain.)

TINCTURA VALERIANÆ, LOND. Tincture of Valerian. (Valerian, bruised, ℥v; proof spirit Oij. Macerate for seven days, then press and strain.)

TINCTURA VALERIANÆ COMPOSITA, LOND. Compound Tincture of Valerian. (Valerian, bruised, ℥v; aromatic spirit of ammonia Oij. Macerate for seven days; press and strain.)

Therapeutics. Valerian acts as a stimulant, and powerful antispasmodic, and is peculiarly adapted for the treatment of the various symptoms occurring in hysterical subjects, as spasm, hemicrania, globus, palpitation, &c.: it has also been found useful in some cases of chorea, epilepsy, hypochondriasis, and, as an adjunct to tonics, in intermittents. Recently the valerianates of zinc, quina, and also of iron, have been extensively employed in medicine. That they are efficacious combinations in cases where zinc, quina, or iron is indicated, there can be no doubt; but as yet there is a want of proof of their being superior to the ordinary compounds of these bases given with the Galenical preparations of valerian.

Dose. Of valerian, in powder, gr. xv to ʒß; of infusum valerianæ, f.℥j to f.℥ij; of tinctura valerianæ, fʒj to f.ʒij; of tinctura valerian. comp., f.ʒß to fʒjß; of valerianate of zinc, gr. j to gr. iij, or more; of valerianate of quina, gr. j to gr. iij; of valerianate of iron, gr. j to gr. v.

COMPOSITÆ.

Inula *Lond.* The root of Inula Helenium, or Elecampane; Lin. Syst., Syngenesia superflua; indigenous, growing in damp meadows.

Description. A thick elongated root, brown externally, but light yellow within, having an aromatic odour and taste.

Prop. & Comp. Contains a peculiar camphor-like body, *helenine* ($C_{15}H_{10}O_2$), crystallising in white needles; insoluble in water; a *bitter extractive*, soluble in water; a peculiar starch striking yellow with iodine, called *Inulin* ($C_{24}H_{21}O_{21}$).

Off. Prep. None; but it enters as an ingredient into Confectio Piperis.

Therapeutics. Stimulant; thought to be tonic, expectorant, and diaphoretic. Seldom used now, was formerly given in the exanthemata, coughs, &c.

Dose. Of the powdered root ʒß to ʒj, or more.

Pyrethrum *Lond.* The root of Anacyclus Pyrethrum, or Pellitory of Spain; Lin. Syst., Syngenesia superflua; growing in Barbary, Spain, and the Levant.

Description. A fusiform root, cut into cylindrical pieces two or three inches long, dark brown in colour, spotted black.

Prop. & Comp. It contains at least two *resins*, one of which has been named *Pyrethric* acid; an *acrid oil*, and tannin.

Therapeutics. A topical irritant, causing pricking in the mouth and flow of saliva and buccal mucus; it is used as a masticatory in paralysis of parts about the mouth.

Absinthium *Lond.* The flowering herb of Artemisia Absinthium, or Wormwood; Lin. Syst., Syngenesia superflua; indigenous, growing in thickets and mountainous places.

Description. It occurs in bundles of the dried herbs, having a silky touch, disagreeable odour, and intensely bitter taste.

Prop. & Comp. The plant yields its bitterness to water and spirit, and contains a *volatile oil* ($C_{20}\ H_{16}\ O_2$), green in colour, with the odour of the plant, also a bitter extract yielding *absinthine* ($C_{16}\ H_{11}\ O_5$), and absinthic acid. The absinthine is the bitter principle.

Therapeutics. A powerful bitter stomachic and tonic, useful in atonic dyspepsia; it has also been reputed to be anthelmintic.

Dose. Of the powder ℈j to ℈ij. It may be infused with advantage (℥j to Oj), of which f.℥j to f.℥ij may be given. It strikes blue with iron salts.

Santonin. A crystalline principle obtained from Artemisia santonica, A. contra, and probably other species of Artemisia. The partially expanded flowers, broken tops, small leaves, &c., known as the Semen contra, or worm seeds, were formerly officinal in the Dublin Pharmacopœia. *Santonin* occurs in

brilliant, white, four-sided, flat prisms,—tasteless, odourless; insoluble in water, but soluble in ether and alcohol: the crystals become yellow by exposure to light: formula ($C_{30}H_{18}O_6$): it has the nature of a crystalline resin with slight acid properties; nitric acid converts it into succinic acid.

Therapeutics. The action is anthelmintic, and it forms a pleasant vermifuge for children.

Dose. From 4 to 6 grains.

Anthemis *Lond.* The flower of Anthemis nobilis, or Chamomile; Lin. Syst., Syngenesia superflua; indigenous, growing in pastures on gravel.

Anthemidis Oleum (Anglicum) *Lond.* The oil distilled from the flower.

Description. The *flowers* may be either single or double, consisting of a yellow convex disk and white rays; the florets of the ray are numerous, white, and three-toothed; those of the disk, yellow; by cultivation many of the latter are converted into white ray florets, and the flower is then said to be double.

Prop. & Comp. The flowers contain a volatile oil, *Oleum Anthemidis*, of a blue colour, becoming yellowish by age; sp. gr. 0·91; probably is a mixture of a hydrocarbon ($C_{20}H_{16}$), the real volatile oil, united with a substance resembling valerianic acid.

Off. Prep. INFUSUM ANTHEMIDIS, LOND. Infusion of Chamomile. (Chamomile flowers ʒv; boiling distilled water Oj. Macerate for ten minutes in a closed vessel, and strain.)

An extract of chamomile is contained in the Edinburgh Pharmacopœia.

Therapeutics. Chamomile is an aromatic stomachic and tonic: in large doses, especially in the form of a warm infusion, it acts as an emetic; it is used in atonic dyspepsia, also to assist the action of emetics. It is thought to be an antiperiodic. The oil is stimulant and carminative, a useful adjunct to purgatives.

Dose. Of the infusion, f.℥j to f.℥iv; of the oil, ♏j to ♏v; of the extract, Edin., gr. v upwards. The extract forms a useful adjunct to stomachic and other pills.

Taraxacum *Lond.* The recent root of Taraxacum Dens

leonis or Common Dandelion; Lin. Syst., Syngenesia æqualis; indigenous.

Description. The root is tapering and branched, yielding a milky juice when cut; of a light brown colour externally, white within; of a sweetish bitter taste.

Prop. & Comp. The juice contains resinous matters, sugar, gum, and a *bitter extractive,* from which a crystalline principle named *Taraxacine* has been obtained, bitter in taste; soluble in alcohol, ether, and hot water, sparingly so in cold. *Mannite* sugar has been also extracted, but whether it is a product of the fermentation of the juice or root is as yet undecided.

Off. Prep. DECOCTUM TARAXACI, LOND. Decoction of Dandelion. (Bruised dandelion ℥iv; distilled water Ojß. Boil down to a pint, and filter.)

EXTRACTUM TARAXACI, LOND. Extract of Dandelion. (Prepare this in the same manner as directed for extract of liquorice.)

Therapeutics. The value of taraxacum as a remedy is a matter which admits of some doubt. It is supposed to have a specific action on the liver, modifying and increasing its secretion; hence its widely spread use in hepatic diseases, more particularly when attended with an habitually engorged state of the vessels of that viscus. Given for some time, it is thought to act as an alterative on that organ. In dropsies from hepatic obstruction, it is generally administered in combination with a purgative.

Dose. Of decoctum taraxaci, f.℥j to f.℥ij; of extractum taraxaci, gr. x to ʒj.

Lactuca *Lond.* The flowering plant of Lactuca sativa, the Garden Lettuce; Lin. Syst., Syngenesia æqualis; indigenous.

Lactucarium *Edin. Dub.* The inspissated juice of Lactuca sativa and of Lactuca virosa, the Wild Lettuce.

Description. The lettuce is too familiar to need description. *Lactucarium,* which is prepared by pressing out the milky juice of the flowering herbs and afterwards inspissating with a gentle heat, occurs in small masses or lumps of a brown colour, with an odour very similar to opium, and a bitter taste. It is obtained in much larger quantities from L. virosa than from L. sativa.

Prop. & Comp. Lactucarium yields to alcohol a bitter extractive matter; it is also sparingly soluble in water. A

crystalline substance, *Lactucerine* (C_{40} H_{34} O_5), soluble in alcohol and ether, but not in water, has been extracted from lactucarium, forming 42 per cent. of the fresh drug; and two other substances, *Lactucic* acid and *Lactucine*, soluble in water, the latter being crystalline and resembling *mannite*.

Off. Prep. Of *Lactuce Sativa.* EXTRACTUM LACTUCÆ, LOND. Extract of Lettuce. (Prepare this as directed for extract of aconite.)

A tincture and lozenge of lactucarium are contained in the Edinburgh Pharmacopœia.

Therapeutics. The lettuce appears to possess some narcotic powers, and has been occasionally eaten at bed-time to produce this effect. The extract and lactucarium are generally employed by the physician, and have been prescribed, in cases in which opium disagrees with the patient, to procure sleep, allay cough, &c. Lettuce has certainly very feeble powers compared with opium, and the author has given ʒß or ℈ij of good lactucarium without noticing any decided narcotic property from its administration. The *extract* contains much less of the peculiar principles than *lactucarium.*

Dose. Of the extract or lactucarium, gr. v to ʒß.

Arnica *U. S.* The flowers of Arnica montana; Lin. Syst., Syngenesia superflua; found in the mountainous parts of Europe.

Description. The flowers are of a dark yellow colour, calyx green; the ray florets ligulate, much longer than the calyx; the florets of the disc tubular.

Prop. & Comp. The flowers, the leaves, and root of this plant, all of which are often employed, have a peculiar odour when fresh, and are apt to excite sneezing. The active properties are taken up by water. In addition to the common constituents of plants it contains a *volatile oil* and a bitter principle identical with *cytisin:* a *volatile alkaloid,* resembling lobelina, has also been procured therefrom.

Therapeutics. Given internally, arnica acts as an irritant on the alimentary canal. It is chiefly employed as an external application for the discussion of tumours, and for sprains and bruises.

Dose. Externally the tincture is the preparation generally employed, consisting of about two ounces of flowers to the pint.

LOBELIACEÆ.

Lobelia *Lond.* The flowering herb of Lobelia inflata, Indian Tobacco; Lin. Syst., Pentandria Monogynia; indigenous in the United States.

Description. The whole herb is officinal; it is generally found in oblong, compressed cakes.

Prop. & Comp. It has a peculiar odour, and a burning taste, not observed for a short time after the substance has been chewed. Besides colouring matters and the common constituents of plants, it contains a volatile oil or peculiar acid, the *lobelic acid*, and an alkaline principle, *lobelina.* This substance forms a yellowish liquid, lighter than water, very soluble in ether and alcohol, and forms crystalline salts with the mineral acids; it is probably the active agent of the plant.

Off. Prep. Tinctura Lobeliæ, Lond. Tincture of Indian Tobacco. (Indian tobacco, powdered, ℥v; proof spirit Oij. Macerate for seven days; then press and strain.)

Tinctura Lobeliæ Ætherea, Lond. Ethereal Tincture of Lobelia. (Indian tobacco, powdered, ℥v; ether f.℥xiv; rectified spirit f.℥xxvj. Macerate for seven days; then press and strain.)

Therapeutics. In small doses it is expectorant and diaphoretic; in larger, emetic or cathartic. In too large quantities it produces much depression, nausea, cold sweats, and even death, preceded by convulsions; it closely resembles tobacco in its action. It has been much lauded in attacks of spasmodic asthma, and also in other affections of the air-passages, attended with dyspnœa. In some cases it forms a useful adjunct to diuretics.

Dose. Of the ethereal tincture ♏x to f.ʒß or more, carefully watching any symptom of vascular depression.

PYROLACEÆ.

Chimaphila *Lond.* The herbaceous part of Chimaphila umbellata or Umbelled Winter Green, called also Pyrola; Lin. Syst., Decandria Monogynia; growing in North America.

Description. The leaves are cuneate, lanceolate, coarsely serrated, coriaceous, smooth and shining; green, when fresh; when dry, yellowish-brown. The flowers form small pinkish-white corymbs.

Prop. & Comp. The fresh plant is fragrant when bruised; when dry, the odour is not unlike tea; taste astringent and bitter; it yields a bitter *extractive matter*, tannin, and perhaps a trace of gallic acid. No crystalline principle has been discovered.

Off. Prep. DECOCTUM CHIMAPHILÆ, LOND. Decoction of Winter Green. (Winter green ℥j; distilled water Ojſs. Boil down to a pint, and strain.)

Therapeutics. Tonic, astringent, and diuretic; now used almost exclusively in catarrhal affections of the bladder, but is said to be useful as a diuretic in albuminuria and dropsies; it has also been employed in scrofula and rheumatism.

Dose. Of the decoction, f.℥j to f.℥ij.

ERICACEÆ.

Uva Ursi *Lond.* The leaf of Arctostaphylos Uva Ursi, Whortleberry, Bear-berry or Trailing Arbutus; Lin. Syst., Decandria Monogynia; growing in the northern parts of Europe and America.

Description. The leaves are dark green, obovate, obtuse, entire, shining on upper surface, reticulated underneath, coriaceous in consistence.

Comp. & Prop. Taste astringent, odour like hay or tea; contains *tannin* about 35 per cent., with a trace of gallic acid, bitter extractive, &c.

Off. Prep. DECOCTUM UVÆ URSI, LOND. Decoction of Whortleberry. (Whortleberry ℥j; distilled water Ojſs. Boil down to a pint, and strain.)

EXTRACTUM UVÆ URSI, LOND. Extract of Whortleberry. (Whortleberry ℔ijſs; boiling distilled water, 2 gallons. Macerate for 24 hours, then boil down to a gallon, and strain the liquor while hot; lastly, evaporate to a proper consistence.)

Therapeutics. An astringent and diuretic, used in vesical and urethral affections, as catarrhus vesica (chronic), to diminish irritability and mucous discharge, also in gleets: sometimes employed in kidney affections; it may be given with alkalies or acids.

Dose. Of powder, gr. x to ʒſs; of decoction, f.℥j to f.℥ij; of extract, gr. v to gr. xv.

Adulteration. Leaves of *Red Whortleberry* or *Vaccinium Vitis Idæa* may be added, distinguished by being dotted and

not reticulated on the under surface, and the margins crenated; also common *box* leaves, which can be recognised by their want of astringency.

STYRACEÆ.

Styrax *Lond.* Storax. Liquid balsam from uncertain plants. It seems however probable much of the storax of commerce is obtained from Styrax officinale, the Storax tree; Lin. Syst., Decandria Monogynia; growing in Syria and on the coast of the Mediterranean.

Description. It occurs in two forms: the *liquid balsam* (officinal), of the consistence of bird-lime, almost opaque, with an aromatic odour; and the *solid storax,* Styrax calamita, in the form of masses which are friable, of a brownish-red colour, covered on the surface with a white efflorescence of benzoic or cinnamic acid, and becoming soft and clammy with the heat of the hand. It is often mixed with saw-dust, turpentine, and other impurities.

Prop. & Comp. Soluble in alcohol and ether, except the impurities; it contains a principle called *styracine* ($C_{60}H_{28}O_6$), which appears to be composed of *cinnamic acid* ($C_{18}H_7O_3$) and styrone ($C_{42}H_{21}O_3+3HO$); a volatile oil, free cinnamic acid, and some resins, probably the products of decomposition, are always present in the storax. The presence of benzoic acid is doubtful.

Off. Prep. Styrax Præparata, Lond. Prepared Storax. (Storax ℔j; rectified spirit, Oiv. Dissolve the storax, and strain through linen; then, by means of a gentle heat, distil the greater part of the spirit; evaporate what is left in a water-bath to a proper consistence).

Pilula Styracis Composita, Lond. Compound Pill of Storax. (Prepared storax ℥vj; powdered opium, saffron, each ℥ij. Beat together, to form a mass.)

Storax is contained in Tinct. Benzoini C.

Therapeutics. The same as the balsams of Peru and Tolu.

Doses. Of the prepared resin, 10 grs. to ℈j; the dose of the compound pill depends on the amount of opium desired to be given.

Benzoinum *Lond.* A balsam (indurated in the air) flowing from the incised bark of Styrax Benzoin or Benjamin tree;

Lin. Syst., Decandria Monogynia; growing in Sumatra, Borneo, and other islands of the Eastern Archipelago.

ACIDUM BENZOICUM, LOND. A crystallised acid prepared from gum benzoin by sublimation.

Description. Benzoin occurs either in the form of reddish-white tears, separate or slightly adherent, but more frequently in masses consisting of the tears completely agglutinated with a brownish-red substance; on fracture, it presents an amydaloid appearance; this forms *Siam* benzoin: an inferior darker kind, called *Calcutta* benzoin, is sometimes met with. The acid will be described below.

Prop. & Comp. Benzoin contains from 10 to 20 per cent. of *benzoic acid;* the remainder consists of a resin, partly soluble in ether. It is soluble in alcohol and liquor potassæ; by heat the acid sublimises, and can be collected. *Benzoic acid* ($C_{14}H_5O_3+HO$), when pure, forms soft, feathery, flexible, white crystals, with a pearly lustre; generally impregnated with empyreumatic oil, which gives it a strong odour; slightly soluble in water, but readily so in rectified spirit; dissolved also by solutions of ammonia, potash, soda, and lime, from which it is precipitated by hydrochloric acid.

Off. Prep. TINCTURA BENZOINI COMPOSITA, LOND. Compound Tincture of Benzoin. (Benzoin, coarsely powdered, ℥iijß; prepared storax ℥ijß; balsam of tolu ʒx; socotrine or hepatic aloes, coarsely powdered, ʒv; rectified spirit Oij. Macerate for seven days, and strain.)

Benzoic acid is contained in Tinct. Camphoræ C.

Therapeutics. *Benzoin* is a stimulant expectorant, formerly usual in chronic bronchitic affections; externally in the form of the tincture (FRIAR'S BALSAM) it is applied as a stimulant to ulcers, and formerly to wounds. *Benzoic acid,* when taken, is converted into and appears in the urine as hippuric acid, rendering the fluid more acid and somewhat irritating, but not diminishing the amount of uric acid: it is sometimes useful in catarrhus vesicæ attended with alkaline urine, &c.

Doses. Of benzoin, gr. x to ʒß; of the compound tincture, ʒß to ʒjß, suspended in water by means of mucilage or yolk of egg; of benzoic acid, grs. x to ℈j.

OLEACEÆ.

Olivæ Oleum *Lond.* Olive Oil, expressed from the fruit of Olea Europæa, the European Olive; Lin. Syst., Diandria Monogynia; growing near the shores of the Mediterranean.

Sapo *Lond.* Soap. Made of olive oil and soda.

Sapo Mollis *Lond.* Soft Soap. Made of olive oil and potash.

Glycerina *Dub.* Glycerine. A sweet principle separated during saponification.

Descrip., Prop., & Comp. The olive fruit, used at dessert, is a smooth, elliptical, single-seeded drupe, about ¾ inch long, and half an inch in diameter, of a dark violet colour. The oil, *Oleum Olivæ,* called also Salad oil, is of a pale straw or greenish colour, slight and agreeable odour and taste; sp. gr. 0·92; and consists of about 12 per cent. of *Oleine,* and 28 per cent. of *Margarine;* it unites with alkalies and other bases, forming soaps; the two alkaline soaps being named Sapo, and Sapo mollis.

Sapo, or the combination of the oil with soda, called also hard soap, is white, or often marbled blue or red, when of the Castille variety, from a little iron, in the form of the different oxides; soluble in water, also in alcohol; the solutions are precipitated by lime, lead, and some other metallic salts: it is composed of *oleate* and *margarate* of soda.

Sapo Mollis, the combination with potash, forms a yellow, transparent, very soft substance, usually spotted with white points, from some crystallisation having taken place; in other respects it agrees with soda soap, and is a compound of *oleate* and *margarate* of potash.

Glycerine, a substance which is separated, when all ordinary fats and oils are saponified, from the oleine, margarine, and stearine, is a slightly yellow syrupy-looking liquid, sp. gr. 1·260, very sweet, mixing readily with water and alcohol: the watery solution does not ferment with yeast, nor does glycerine itself evaporate or dry at an ordinary temperature. Its composition is represented by the formula ($C_6\ H_7\ O_5 + H\ O$).

Off. Prep. Olive oil is contained in many cerates, plasters, ointments, and liniments.

Of Sapo. CERATUM SAPONIS COMPOSITUM, LOND. Compound Soap Cerate. (Soap ℥x; wax ℥xijß; powdered oxide of lead

℥xv; olive oil Oj; vinegar, a gallon. Boil the vinegar with the oxide over a slow fire, constantly stirring until they unite; then add the soap, and boil again in a similar manner, until all the moisture is evaporated; lastly, mix the wax with these, having previously melted it in the oil.)

EMPLASTRUM SAPONIS, LOND. Plaster of Soap. (Soap, sliced, ℔ß; plaster of lead ℔iij; resin ℥j. Melt the plaster over a slow fire; add the soap and resin; first liquefied, then constantly stirring, evaporate to a proper consistence.)

LINIMENTUM SAPONIS, LOND. (Soap ℥ijß; camphor ʒx; spirit of rosemary, f. ℥xviij; distilled water, f. ℥ij. Mix the water with the spirit, then add the soap and camphor, and macerate, frequently shaking them until they are liquefied.)

Hard Soap is also contained in some other liniments.

Of Sapo Mollis. PILULA ALOES CUM SAPONE, LOND. Pill of Aloes with Soap. (Extract of Barbadoes aloes powdered, soft soap, extract of liquorice, equal parts; treacle, as much as may be necessary. Beat the extract of aloes with the soap, add the remaining ingredients; beat altogether to form a mass.)

PILULA SAPONIS COMPOSITA, LOND. Compound Soap Pill. (Opium powdered, liquorice powdered, each ʒij; soft soap ʒvj. Beat all together, to form a mass.)

Soft Soap is contained in other preparations, as Unguentum Sulphuris Comp., Enema Colocynthidis, and many pill masses.

Therapeutics. *Olive Oil* is used in medicine internally as a demulcent in the form of emulsion: it may also be used as an enema: if taken in large doses it is slightly laxative, as is the case with almost all fixed oils: externally it is much employed in the form of liniments as a lubricating substance.

Soaps act as antacids, but are apt to disagree with the stomach from the liberation of the fatty acids, especially, as often happens, when not made of olive oil: they possess no particular value as internal remedies, and are more used as adjuncts to other drugs in the form of pill, when they sometimes favour solution, than for their medicinal virtues. Soaps are used in the form of external applications, and are more valued for their mechanical effects than for any special property they possess.

Glycerine is used on account of its physical properties as an adjunct to lotions in skin diseases, to prevent the surface becoming dry; also proposed by Mr. T. Wakley as a substitute for oil in the treatment of some forms of deafness.

Dose. Of olive oil, f. ʒj to f. ℥j, or more, as a demulcent or laxative; of sapo or sapo mollis, as an antacid, &c., gr. v to ℈j.

Adulteration. Soap made from animal oils or fats and potash, is very commonly made use of in place of the officinal soft soap, and common hard soap is substituted for the Castile variety.

Manna *Lond.* The juice (concreted) flowing from the incised bark of Fraxinus rotundifolia and Fraxinus ornus? Lin. Syst., Diandria Monogynia; native of Sicily and Calabria. It is probable that both trees yield manna, and a similar substance can be obtained from Fraxinus excelsior, when growing in the southern parts of Europe.

Description. Manna of the best description, called flaked manna, forms long white pieces not unlike stalactite masses, several inches in length, and about one inch broad, hollowed out and discoloured on the side which was attached to the tree; it may also occur in small masses, or tears, and when of an inferior kind, in broken and coloured fragments, mixed with impurities. Manna has a sweetish odour and taste, but it is also rather bitter.

Prop. & Comp. Manna is readily soluble in water; it dissolves also in alcohol, and consists almost entirely of a peculiar sugar, named *Mannite* ($C_6 H_7 O_6$), which crystallises in four-sided prisms, is sweet, and differs from grape or cane sugar in not fermenting; a small amount of *bitter matter* also exists in manna, the nature of which is unknown.

Off. Prep. It is contained in Confectio Cassiæ, and Syrupus Sennæ.

Therapeutics. A very mild laxative, adapted for children; also, a pleasant adjunct to some purgative draughts: it sometimes causes flatulence and griping.

Dose. ʒj to ℥ß, or more.

The leaves of Fraxinus excelsior, or Common Ash, have long been used in medicine, but within the last few years they have been much extolled in Germany and France in the treatment of gout and rheumatism: their real composition is unknown. From the author's experience of their effects in gout, he is not at all inclined to think highly of their value, for in several cases they failed to afford the slightest alleviation, when the use of other treatment was immediately followed by relief.

LOGANIACEÆ.

Nux Vomica *Lond.* The seed of Strychnos Nux Vomica Nux vomica, or Koochla Tree; Lin. Syst., Pentandria Mono gynia; growing in the East Indies.

Strychnia *Lond.* An alkaloid prepared from Nux Vomica (crystalline).

Description. The fruit is a round berry, like an orange, filled, when ripe, with a jelly-like pulp, and containing the *seeds*, which are round, flattened, and concavo-convex, from half an inch to an inch in diameter, very tough and horny, covered with a velvety down consisting of fine hairs; their colour is yellowish-grey, with no odour, but of an intensely bitter taste. The alkaloid strychnia is described below.

Prop. & Comp. These seeds contain two alkaloids, strychnia and brucia, united with a peculiar acid. *Strychnia* (C_{42} H_{22} N_2 O_4) crystallises in four-sided prisms or octahedra, requires about 1000 parts of water to dissolve it, very soluble in hot alcohol, decomposed by heat, is intensely bitter, forms crystalline salts with acids; with bichromate of potash and oil of vitriol it gives a beautiful lake colour; is not reddened by nitric acid. *Brucia* (C_{46} H_{26} N_2 O_8) crystallises with eight equivalents of water; much more soluble in water, but less bitter than strychnia; soluble in alcohol; forms salts with acids; it is coloured red by nitric acid, but does not give the tests with the bichromate. *Igasauric* or *Strychnic* acid precipitates copper salts bright-green; it can be crystallised.

Off. Prep. Extractum Nucis Vomicæ, Lond. Extract of Nux Vomica. (Nux vomica, ℥viij; rectified spirit, Oiij. Steam the nux vomica so as to soften it; afterwards cut it into thin slices, bruise, and dry it; macerate for seven days in two pints of spirit; press out the tincture, and strain. Macerate again, in the remaining spirit, for three days; then again press and strain. Let the greater part of the spirit distil from the mixed tinctures, and evaporate what remains to a proper consistence.)

Therapeutics. Nux vomica is a powerful stimulant to the spinal cord, causing, in large doses, twitching of the muscles, followed by tetanic rigidity and death from asphyxia; paralysed parts are more readily affected than sound ones. It acts also as a bitter stomachic, and in some dyspeptic cases, as in pyrosis, often relieves; its chief use, however, is confined to the treatment

of paralysis, and more especially when depending on lead poisoning, or in the local forms of paralysis; sometimes, however, it is employed in paraplegia, and even in hemiplegia, when all inflammatory symptoms have subsided. The alkaloid *strychnia* acts exactly in the same manner as the nux vomica, and constitutes the active part; it should be given with great caution. *Brucia* is almost inert: from the author's experience it does not, *when pure*, produce any of the effects of strychnia, even in large doses; perhaps it is tonic and antiperiodic.

Dose. Of powdered nux vomica, gr.j to gr.iij; of the extract, gr.$\frac{1}{4}$ to gr.ij; of strychnia, gr.$\frac{1}{32}$ to gr.$\frac{1}{4}$.

Adulteration. Of *strychnia*, the presence of *brucia*, in varying, sometimes large, quantities, rendering the alkaloid much less powerful; detected by the red colour produced by nitric acid. The bark of strychnos nux vomica contains the same alkaloids as the seeds; it is known as False Angostura Bark, being sometimes employed to adulterate the true Angostura Bark; for the method of distinguishing this adulteration, *vide* the article on Cusparia.

Faba Sancti Ignatii. St. Ignatius' Bean. The seed of the Strychnos Ignatii; Lin. Syst., Pentandria Monogynia; inhabiting the Philippine Islands.

Description. The seeds are of a brown colour, semitransparent, of a tough horny texture; convex on one side; somewhat triangular, with irregular facets on the other.

Prop. & Comp. These beans are remarkable for the large proportion of *strychnia* they contain, the quantity being greater than that yielded by the nux vomica seeds. They yield about 1·2 per cent. of the alkaloid, and their activity is due to the presence of this substance. An extract has been made from them, which is thought by some to differ in its properties from that of nux vomica, but there can be no doubt the difference is in degree only, strychnia being the active ingredient.

ASCLEPIADACEÆ.

Hemidesmus Indicus *Dub.* The Root. Lin. Syst., Pentandria Digynia. Indian Sarsaparilla. Native of India.

Description. It occurs in long cylindrical pieces; the colour of the cortex is dark, marked by longitudinal divisions and deep circular rings; the central portion ligneous: a somewhat fragrant odour, and bitter taste.

Prop. & Comp. It yields its active properties to boiling water, and contains a peculiar volatile, crystallisable substance, with acid properties: this has been called the Smilasperic or Hemidesmic Acid.

Off. Prep. SYRUPUS HEMIDESMI, DUB. Syrup of Indian Sarsaparilla. (Indian sarsaparilla, bruised, ℥iv; boiling distilled water, Oj; refined sugar, in powder, as much as is sufficient. Infuse the sarsaparilla in the water for four hours, in a covered vessel, and strain; set it by until the sediment subsides, then decant the clear liquor; and having added to it twice its weight of sugar, dissolve with the aid of a steam or water heat.)

Therapeutics. Its action is supposed to be the same as sarsaparilla, and it has been used as a substitute for that root, especially in India, in syphilitic cutaneous eruptions, &c., and also in some diseases of the kidney.

CYNANCHUM ARGEL, the leaves of which have been referred to as constituting one of the adulterations of senna, belongs to this natural order.

SPIGELIACEÆ.

Spigelia *Edin.* The Root of Spigelia Marilandica, Carolina Pink; Lin. Syst., Pentandria Monogynia; native of the south and south-western parts of North America.

Description. The root consists of a thick globular head, from which numerous thinner and tortuous fibres branch out; of brown colour.

Prop. & Comp. It contains, in addition to saccharine and mucilaginous matters, a *volatile* and fixed oil, and a peculiar *bitter principle,* upon which its activity depends; this is soluble in water.

Therapeutics. Much employed in the United States as an anthelmintic; it produces, in moderate doses, considerable cathartic action, and in some cases, peculiar narcotic effects. It may be administered in substance, or in the form of infusion; generally combined with a purgative.

Dose. ʒj to ʒij for an adult.

GENTIANACEÆ.

Gentiana *Lond.* Gentian. The Root of Gentiana lutea, or Yellow Gentian; Lin. Syst., Pentandria Digynia; growing

chiefly in the European Alps and Pyrenees; imported from Marseilles and other French ports.

Description. The root occurs in lengthened cylindrical pieces, from ½ inch to 1½ inch in diameter; wrinkled longitudinally, and often twisted; brown externally; yellow and spongy, yet tough, within.

Prop. & Comp. Odour sweet; taste, very bitter and sweetish; it yields to water and spirit its bitter principle, *gentianite*, which has not been crystallised: *gentianin* (C_{14} H_5 O_5) is crystallisable, yellow, not bitter, its colour is deepened by alkalies; formerly supposed to be the active principle. Sugar, gum, and pectin, &c., are also present in gentian root.

Off. Prep. Extractum Gentianæ, Lond. Extract of Gentian. (Sliced gentian ℔iij; distilled water, Ovj. Macerate for twelve hours in four pints of water; pour off, and strain the liquor. Add two pints of water to the remainder, macerate for six hours, gently press out the liquor, and strain. Lastly, evaporate the mixed liquors to a proper consistence.)

Infusum Gentianæ Compositum, Lond. Compound Infusion of Gentian. (Sliced gentian, dried orange peel, each, ʒij; lemon peel ʒiv; boiling distilled water, Oj. Macerate for an hour in a closed vessel, and strain.)

Mistura Gentianæ Composita, Lond. Compound Mixture of Gentian. (Compound infusion of gentian, f.℥xij; compound infusion of senna, f.℥vj; compound tincture of cardamoms, f.℥ij. Mix.)

Tinctura Gentianæ Composita, Lond. Compound Tincture of Gentian. (Gentian, sliced, ℥ijss; rind of orange, dried, ʒx; cardamom, bruised, ʒv; proof spirit, Oij. Macerate for seven days, then press and strain.)

Therapeutics. Gentian is a simple bitter, or stomachic tonic, improving the appetite and giving tone to the stomach; hence useful in convalescence from acute disease, and in cases of dyspepsia attended with an atonic condition of that viscus.

Dose. In substance, from gr. x to ℈ij; of extract, gr. x and upwards; of infusion, f.℥j to f.℥ij; of compound mixture, f.℥j to f.℥ij; of compound tincture, f.ʒj to f.ʒij.

Chiretta *Edin. & Dub.* Herb and Root of Agathotes Chirayta; Lin. Syst., Pentandria Monogynia; grows in the northern parts of India.

Description. As imported, it is in bundles consisting of the

stems of the plant, with part of the roots attached; the stems have a yellow pith.

Prop. & Comp. The plant is very bitter, and yields to water and alcohol a bitter extractive, similar to that obtained from gentian.

Off. Prep. INFUSUM CHIRETTÆ, EDIN. (Chiretta ℥iv; boiling water, Oj. Infuse for two hours, and strain through linen or calico.)

Both an infusion and tincture are contained in the Dublin Pharmacopœia.

Therapeutics. Exactly the same as gentian.

Dose. Of the infusion, f.℥j to f.℥j.

Other plants belonging to this order, as ERYTHRÆA CENTAURIUM, the Common Centaury, and MENYANTHES TRIFOLIATA, the Common Buck-bean, contain a similar bitter principle, and have been occasionally employed in the place of gentian root.

CONVOLVULACEÆ.

Scammonium *Lond.* Scammony, a gum resin exuding from the cut root of Convolvulus scammonia; Lin. Syst., Pentandria Monogynia; growing about the shores of the Levant, and exported chiefly from Smyrna.

Description. In masses, irregular in shape and size, of a blackish-green colour, covered with fine powder, porous, brittle, and shining fracture. It has a musty odour, makes a lather when rubbed on the surface with water; taste nauseous and acrid after a few minutes. Contains a large amount of resin called *Scammonin* ($C_{40} H_{33} O_{20}$), a feéble acid, soluble in ether, also in alcohol but precipitated by water from its solutions.

Prop. & Comp. Scammony should emit no bubbles of gas when treated with hydrochloric acid, nor, when digested in water at 170° Fah., should the fluid be tinged of a blue colour on the addition of iodide of potassium and diluted nitric acid, or with free iodine. Of pure or virgin scammony, at least 78 per cent. should be soluble in ether. The above tests show the absence of chalk or starch, and also the amount of resin.

Off. Prep. CONFECTIO SCAMMONII, LOND. Confection of Scammony. (Scammony ℥jß; cloves and ginger, bruised, each ʒvj; oil of carraway, f. ʒß; syrup of roses, as much as may be necessary. Rub the dry ingredients together to a very fine powder; preserve in a covered vessel. When the confection is to be used

pour in the syrup, rub again, and lastly, add the oil, and mix thoroughly.)

MISTURA SCAMMONII, EDIN. (Made by triturating 7 grains of resin of scammony with f.℥iij of unskimmed milk, so as to form an emulsion.)

PULVIS SCAMMONII COMPOSITI, LOND. Compound Scammony Powder. (Scammony, hard extract of jalap, each ℥ij; ginger ℥ss. Rub them separately into a very fine powder, and mix.)

Therapeutics. A drastic purgative, generally causing much watery discharge, and often griping; useful to give activity to other purgatives, which appear to diminish its violence. It is employed in cerebral and dropsical effusions, torpidity of bowels, and as a vermifuge for children; it is contra-indicated in inflammatory affections of the digestive organs.

Dose. Of powdered scammony (pure) gr. v to gr. x; of scammonin (the pure resin) gr. iv to gr. viij; of conf. scammonii gr. xv to ℨss or more; of mist. scammonii f.℥ss to f.℥iij. As an adjunct to other purgatives, it may be given in smaller quantities.

Adulteration. Scammony is most extensively adulterated with *chalk*, *flour*, other *resins*, and *extracts*. Sometimes the drug contains but a small per-centage only of real scammony. The frauds are detected by the tests given above.

Jalapa *Lond.* Jalap. The tuber of the Exogonium Purga, or true Jalap plant; Lin. Syst., Pentandria Monogynia; growing in Mexico, named from the city Xalapa.

Description. The tubers are ovoid, more or less pointed, varying from ½ an inch to 3 or 4 inches in diameter, of a brown colour, and wrinkled externally; internally yellowish, and in concentric layers. Structure dense and resinous in appearance; occasionally it is found worm-eaten. Sometimes the tubers are sliced.

Prop. & Comp. Jalap has a sweetish odour and taste, at the same time nauseous; it contains from 10 to 15 per cent. of resin, 20 of watery extractive matter, with starch, &c. Jalap resin, *Jalapin* ($C_{40} H_{34} O_{18}$), soluble in alcohol, not in ether or water; becomes crimson with oil of vitriol. There exists another resin in smaller quantities, soluble in ether, which has been called *Jalapic acid.*

Off. Prep. EXTRACTUM JALAPÆ, LOND. Extract of Jalap. Powdered jalap lbijss; rectified spirit, a gallon; distilled water, two gallons. Macerate the jalap in the spirit for four days, and

pour off the tincture. Boil down the residue in water to half a gallon; strain separately, distil off the spirit from the tincture, and evaporate the watery decoction until each thickens; then mix them together, and evaporate to a proper consistence. This extract may be kept soft to form pills, or hardened and reduced to powder.) In this extract both the resin and watery extractive matters are contained.

The Edinburgh extract, or resin, consists of impure jalap resin, being made with strong spirit only.

Pulvis Jalapæ Compositus, Lond. Compound Powder of Jalap. (Jalap ℥iij; bitartrate of potash ℥vj; ginger ʒij. Rub them separately into powder, then mix.)

Tinctura Jalapæ, Lond. Tincture of Jalap. (Jalap, coarsely powdered, ℥v; proof spirit, Oij. Macerate for seven days, press and strain.) Proof spirit takes up both the resin and watery extract.

Therapeutics. A brisk purgative, causing watery discharge; much allied to, but less irritant than, scammony; used as an ordinary purgative in costiveness and inflammatory affections, especially when combined, which diminishes the griping; also as a hydragogue in dropsies, and vermifuge when joined to the bitartrate of potash or calomel.

Doses. Of the powder, gr. x to ʒß; of the resin (jalapine), gr. ij to gr. vj; of ext. jalapæ, gr. vj to ℈j; of tinct. jalapæ, f. ʒß to f. ʒij.

Adulteration. Other roots, as of Ipomea orizabensis, &c., distinguished by the absence of the characters of true jalap.

SOLANACEÆ.

Dulcamara *Lond.* The young shoots or twigs of Solanum Dulcamara, Woody Nightshade, or Bitter-Sweet; Lin. Syst., Pentandria Monogynia; indigenous, growing in hedges.

Description. The dried twigs are met with in small pieces, one or two inches long, about the size of a quill; of a brown colour externally, light within, and containing much pith: the twigs should be collected in autumn, when devoid of leaves.

Prop. & Comp. Without odour; of a sweetish-bitter taste; contains an alkaloid, *Solania* (C_{84} H_{68} N O_{28}?) crystallising in white pearly scales or needles; insoluble in water and ether; soluble in alcohol; found also in Solanum nigrum and Solanum tuberosum. A bitter-sweetish extract, named *Dulcamarine*, or *Picroglycion*, exists also in the twigs: the acid is probably the malic.

Off. Prep. DECOCTUM DULCAMARÆ. Decoction of Woody Nightshade. (Dulcamara ℥x; distilled water, Ojß. Boil down to a pint, and strain.)

Therapeutics. The real action of dulcamara is unknown; it does not dilate the pupils or produce dryness of the throat like belladonna, henbane, or stramonium, but it seems to act on the skin and kidneys; it has been employed chiefly in chronic skin diseases, as lepra and psoriasis, sometimes with apparent benefit; occasionally it has been used in cachectic states of the system, as an alterative, as in syphilis.

Dose. Of the decoction, f. ℥j to f. ℥iv, or more. The author has given Oiij per diem, without any marked action; he has also administered as much as ℔ß of the fresh berries of the plant, and with no ill effects.

Belladonna *Lond.* The recent and dried leaf of Atropa Belladonna, or Deadly Nightshade; Lin. Syst., Pentandria Monogynia; indigenous, growing in woods and gardens.

Atropia *Lond.* A crystalline alkaloid, prepared from the root of the same plant.

Description. The *leaves* are large, ovate, entire, smooth, and soft, fœtid when bruised; placed in pairs, unequal in size; the flowers are of a dirty violet brown; the *root* is large, fleshy, tapering, and branched. The uncultivated plant is stated by the London College to be preferable to the cultivated.

Prop. & Comp. All parts of the plant contain an alkaloid, *Atropine* (C_{34} H_{23} N O_6), which occurs in white crystalline prisms; soluble to some extent in water and ether, much more so in alcohol; probably malic acid exists in combination with the alkaloid. Other principles have been described, as *Belladonnine*, &c., but little is known about them.

Off. Prep. EXTRACTUM BELLADONNÆ, LOND. Extract of Belladonna. (Prepare this in the same manner as ordered for Extract of Aconite.)

EMPLASTRUM BELLADONNÆ, LOND. Belladonna Plaster. (Extract of belladonna, plaster of soap, of each ℥iij. Add the extract to the plaster, melted by the heat of a water bath; mix, and keep constantly stirring to a proper consistence.)

TINCTURA BELLADONNÆ, LOND. Tincture of Belladonna. (Dried belladonna ℥iv; proof spirit Oij. Macerate for seven days, then press and strain.)

UNGUENTUM BELLADONNÆ, LOND. Belladonna Ointment. (Extract of belladonna ʒj; lard ℥j. Rub together.)

ATROPIÆ SULPHAS, LOND. Sulphate of Atropine. (Dilute sulphuric acid, f. ʒij; atropia ℈vijß, or as much as may be necessary; distilled water, f. ℥ß. Add the atropia gradually to the acid, mixed with water to saturation. Let the solution be strained, and evaporate at a gentle heat, that crystals may be formed. This salt is intended for external use only.)

Sulphate of atropine is seldom found crystalline, and it is very questionable whether the pure alkaloid, which crystallises so readily, cannot advantageously be made use of dissolved in water by means of a drop of some dilute acid.

Therapeutics. Applied to the eye, Belladonna, or any of its preparations, causes dilatation of the pupil, a topical effect only; when to a painful part, relief is often afforded. Taken internally in small doses, the first effect noticed by the patient is dryness of the throat, thirst, and a difficulty of deglutition; if continued, the vision becomes impaired, and the pupils dilated. The alteration of vision appears to be due to the production of presbyopia from want of adjusting power of the eye, and not to diminished sensibility of the retina: the further effects produced by the drug are seen in the excitement of the excito-motory system, and of the mental faculties, and delirium, generally of a harmless character, accompanied with intense thirst ensues; beyond this, belladonna produces convulsions, paralysis, coma, and death. The effects of *Atropia* are identical with those of the plant itself.

Belladonna is given internally to allay pain and spasm in neuralgic affections, gastrodynia, colic, and spasms of the different sphincters, as of the uterus, bladder, and rectum; also in some nervous diseases, as chorea, epilepsy, and certain forms of hysteria, pertussis, asthma, and other nervous coughs. Externally its chief employment is as a pupil dilatator in ophthalmic cases; sometimes it is used in the form of fomentation to painful parts, sometimes as an injection.

Dose. Of extract, gr. $\frac{1}{6}$ to gr. j; of tincture, ♏v to ♏xx.

Atropine should not, as a rule, be given internally: in solution, of the strength of from one to four grains to the fluid ounce, it may be employed by the oculist; for this purpose, a little spirit should be added, to prevent the solution becoming mouldy. The extract or ointment of belladonna may be used for the same purpose, smeared round the eye; or the sulphate of the alkaloid may be made use of.

Stramonii Folium et Semen *Lond.* The Leaf and Seed

of Datura Stramonium, or Thorn Apple; Lin. Syst. Pentandria Monogynia; an indigenous plant growing in waste places.

Description. The *leaves* are ovate, smooth, unequally sinuate, toothed, dark green, of a rank odour when fresh. The *seeds* are brownish-black, reniform, and flattened.

Prop. & Comp. All parts of the plant contain an alkaloid, named *Daturia* ($C_{34} H_{23} N O_6$), in white prisms; with properties like those of atropia, it is united perhaps with malic acid.

Off. Prep. EXTRACTUM STRAMONII, LOND. Extract of Stramonium. (Stramonium seeds ℥xv; boiling distilled water, a gallon. Macerate for four hours in a vessel lightly covered near the fire, afterwards take out the seeds and bruise them in a stone mortar; return them when bruised to the liquor; then boil down to four pints, and strain the liquor while hot; lastly, evaporate to a proper consistence.)

A Tincture of Stramonium is contained in the Dublin Pharmacopœia (℥v of the seeds to Oij of proof spirit).

Therapeutics. The action of stramonium appears to be exactly the same as that of belladonna; dryness of the throat, dilatation of the pupils, delirium, coma, and death ensue from poisonous doses of the drug. Stramonium has been supposed to influence especially the respiratory organs as an anti-spasmodic, and has been much used in asthma, chiefly in the form of the smoke from the burning leaf employed in the same way as tobacco. The extract has also been used in convulsive coughs, as an anti-spasmodic and as an anodyne in gastrodynia and other painful affections.

Dose. Of leaves (powdered), gr. j upwards; of the extract, gr. ¼ to gr. 1½. When smoked, any dryness of the throat or dilatation of the pupils should lead to its discontinuance for the time.

Hyoscyamus *Lond.* The fresh and dried stalk-leaf of Hyoscyamus Niger or Henbane; the second year's herb, Lin. Syst., Pentandria Monogynia; indigenous, growing in waste places.

Description. The leaves are green in colour when fresh, sessile, oblong, acutely sinuous, woolly, viscid, and fœtid. The seeds are very small and brown, sometimes employed medicinally.

Prop. & Comp. All parts of the plant contain *Hyoscyamia*, a crystalline alkaloid only once or twice obtained in a crystalline state, an acid probably *malic*, and a volatile principle are also present.

Off. Prep. EXTRACTUM HYOSCYAMI, LOND. Extract of Henbane. (Prepare this in the same way as ordered for Extract of Aconite.)

TINCTURA HYOSCYAMI, LOND. Tincture of Henbane. (Dried henbane leaves, ℥v; proof spirit, Oij. Macerate for seven days, then press and strain.)

Therapeutics. Henbane appears to act as belladonna and stramonium, but is much milder, and is used chiefly as a calmative in certain excited conditions of the nervous system when opium is not advisable; it is also employed to diminish pain and allay irritation of the bladder, to prevent the griping of purgative medicines, ease cough, and diminish spasm in very many diseases. It may be used to dilate the pupil in place of belladonna.

Dose. Of the extract, gr. v to gr. x, or more; of the tincture, ♏xx to f. ʒjß.

Tabacum *Lond.* The leaf of Nicotiana Tabacum or American Tobacco; Lin. Syst., Pentandria Monogynia; growing in tropical America.

Description. The leaves are large, ovate or oblong, lanceolate, acuminate, pale green when fresh, yellowish-brown when dry.

Prop. & Comp. Odour of the leaf, which is very slight when fresh, becomes strongly narcotic in drying; a liquid alkaloid, *Nicotina* ($C_{20}\,H_{14}\,N_2$), is contained, united with some acid; nicotina, when pure, appears as a colourless oil, but becomes yellow by exposure; sp. gr. 1·048; volatilises at 482° Fah. A volatile oil, named *Nicotianin*, is also present.

Off. Prep. ENEMA TABACI, LOND. Enema of Tobacco. (Tobacco ℈j; boiling water Oß. Macerate for an hour, and strain.)

Therapeutics. Tobacco, when internally administered, acts as a powerful sedative, especially affecting the heart, like digitalis; it also, as that drug, frequently causes diuresis, and may be used in dropsy. It is however, on account of the dangerous depression often induced, seldom employed as an internal remedy, except in the form of Enema Tabaci, which is occasionally prescribed in strangulated hernia, ileus, &c. to produce great muscular relaxation. Externally tobacco acts as a powerful irritant, and is occasionally ordered medicinally as snuff, as an errhine in head affections, &c.; also in the form of smoke, as a sedative and expectorant in some varieties of asthma.

Dose. The Enema Tabaci, *Lond.*, contains about the quantity of the drug safe to administer at a time.

Capsicum (Guineense) *Lond.* The fruit of Capsicum fastigiatum (Capsicum annuum, of Pharm. 1836); Chilli; Lin. Syst., Pentandria Monogynia; growing in Mexico and tropical South America.

Description. A small oblong, cylindrical or conical fruit, of a bright scarlet or orange-red colour, shining on the surface, divided internally into two or three cells, containing some spongy pulp and numerous white, flat, reniform seeds. The London College orders the fruit to be less than an inch in length.

Prop. & Comp. No odour, taste hot and acrid. A volatile principle, *Capsicin*, somewhat like a concrete volatile oil, is contained; soluble in alcohol, ether, essential oils, slightly so in water: a red extractive matter is also present.

Off. Prep. Tinctura Capsici, Lond. Tincture of Capsicum. (Capsicum, bruised, ʒx; proof spirit, Oij. Macerate for seven days, then press and strain.)

Therapeutics. Capsicum acts as a powerful topical stimulant, and also on the general system; used chiefly as a condiment, sometimes in atonic dyspepsia, diarrhœa, and extreme prostration; as a gargle in cynanche maligna and scarlatina; externally it can be used as a rubefacient.

Dose. Of powder, gr. ij to gr. x, in pills; of tincture, ♏xx to f. ʒj. As a gargle, f. ʒj to f. ʒiij to ℥vj of fluid.

Adulteration. The powdered capsicum (cayenne pepper) is extensively adulterated with red-lead and other like coloured substances.

SCROPHULARIACEÆ.

Digitalis *Lond.* Foxglove. The stem-leaf of Digitalis Purpurea, the wild plant, in the fresh and dry state; Lin. Syst., Didynamia Angiospermia. Indigenous.

Description. The leaf is ovate, lanceolate, or oblong; crenate, rugous, and downy, more especially on the under surface, which is veined; subsessile, or with a short petiole: of a dull green colour. The leaves should be gathered before the terminal flowers have expanded, the petiole and midrib removed, and the laminæ carefully dried.

Prop. & Comp. Foxglove leaves have but little odour; their

taste is somewhat bitter and acrid, they contain a non-nitrogenised amorphous principle, *digitaline*, which is white or slightly yellow; very bitter, neutral, little soluble in water, but readily dissolved by alcohol, and slightly by ether; coloured green by hydrochloric acid. Composition unknown; recently stated by M. Lebourdais to be crystalline. Several other substances have been said to occur, to which peculiar names have been given, but whose nature and properties are but ill-understood. The leaves, however, contain some *tannin*.

Off. Prep. INFUSUM DIGITALIS, LOND. Infusion of Digitalis. (Dried digitalis leaves, ʒj; spirit of cinnamon, f.℥j; boiling distilled water, Oj. Macerate the digitalis for four hours in the water, in a closed vessel, and strain.)

TINCTURA DIGITALIS, LOND. Tincture of Digitalis. (Digitalis leaves, dried, ℥iv; proof spirit, Oij. Macerate for seven days, then press and strain.)

Therapeutics. When taken internally, the most marked effect produced by the drug is the weakening of the heart's power, accompanied by a diminished rate of the pulse; some observers assert, that the heart's action is primarily quickened. If the dose be increased, or continued after a certain amount of cardiac weakness has been induced, then symptoms of an alarming character may arise, such as nausea, vomiting, faintness, and syncope: this is especially apt to occur when the patient attempts to make any exertion, or even to sit or stand up; in fact, patients under the full influence of the drug, which is sometimes purposely induced, are only in safety when in an horizontal position. Although digitalis acts so powerfully upon the heart, yet its influence over the capillary circulation, when in a morbid condition, is by no means so prominently observed as in the case of antimonial and mercurial preparations. Digitalis often produces copious diuresis, more especially when the deficiency of the urinary secretion depends on cardiac disease; it also occasionally induces sleep, or acts as calmative and soporific, but only when the restlessness is due to an over-excited state of the heart. Digitalis is administered as a cardiac sedative in almost all cases where there is exalted function, whether sympathetic in nature, or depending on organic disease of that organ, or the great vessels, as in hypertrophy, aneurism, or valvular disease, &c.; it should, however, always be borne in mind, that increased action of the heart is not always an indication of increased strength. Digitalis may be given also in hæmorrhages of an active character, and as a diuretic in dropsies depending on the above-named cardiac

diseases, and sometimes in other forms. Some practitioners have proposed the use of digitalis in inflammatory affections, but in these cases its efficacy has not been well established. It has also been employed in phthisis, but without permanent benefit; for although it often in these cases diminishes the rapidity of the pulse, it exerts no influence on the progress of the tubercular disease. Digitalis is generally asserted to be a drug the action of which is *cumulative* in character: the explanation of this peculiarity appears to the author to be as follows, viz.: that considerable weakening of the heart's action may occur without any very evident symptom being produced; but if this is increased above a certain point, so as to interfere with the efficiency of the circulation, that all the symptoms become rapidly and dangerously manifested.

Dose. Of the powdered leaves, gr. $\frac{1}{2}$ to gr. ij; of infusion, f.ʒij to f.℥ß or more; of tincture, ♏v to ♏xl; of digitaline, gr. $\frac{1}{40}$ to gr. $\frac{1}{10}$.

Adulteration. Digitalis leaves are occasionally mixed with those of *Verbascum Thapsus* and other plants. Attention to the characters of the true leaf, above given, will readily distinguish the admixture.

LABIATÆ.

Rosmarini Oleum (Anglicum) *Lond.* The oil distilled from the flowering tops of Rosmarinus officinalis, or Rosemary (English); Lin. Syst., Diandria Monogynia; growing chiefly on the hills in the South of Europe.

Prop. & Comp. This oil has the fragrant odour and taste of the plant, colourless, sp. gr. 0·888. Composition ($C_{45}\ H_{38}\ O_2$) or ($9\ C_5\ H_4 + 2\ HO$).

Off. Prep. SPIRITUS ROSMARINI, LOND. Spirit of Rosemary. (Oil of rosemary, f.ʒij; rectified spirit, a gallon. Dissolve.) It is contained also in Tinct. Lavand. C. and Linimentum Saponis.

Therapeutics. A powerful stimulant; useful in hysteria, and nervous headaches; externally as a rubefacient and for its odour.

Dose. Of the oil, ♏iij to ♏x; of the spirit, f.ʒß to f.ʒj or more.

Lavandulæ Oleum (Anglicum) *Lond.* The oil distilled from the flower of Lavandula Vera or Common Lavender

(English); Lin. Syst., Diandria Monogynia; a native of Southern Europe; much cultivated in gardens in Surrey. Oil of Spike (French Lavender) is often used in lieu of the English oil.

Description, Prop. & Comp. Oil of Lavender, which gives the odour and taste to the plant, is of a pale yellow colour, sp. gr. 0·877. Composition ($C_{15}\,H_{14}\,O_2$) or ($3\,C_5\,H_4 + 2\,HO$.)

Off. Prep. TINCTURA LAVANDULÆ COMPOSITA, LOND. Compound Tincture of Lavender. (Oil of lavender, f.ʒjß; oil of rosemary ♏x; cinnamon and nutmeg, bruised, each ʒijß; red saunders, sliced, ʒv; rectified spirit, Oij. Macerate the cinnamon, nutmeg, and red saunders, in the spirit, for seven days; then press and strain, and dissolve the oils in the strained tincture.) Contained also in Lin. Camphor. C. and Tinct. Ammon. C.

Therapeutics. Stimulant and carminative; used in hysteria, hypochondriasis, and other nervous affections, also in flatulence and colic.

Dose. Of the oil, ♏iij to ♏x; of the compound tincture, f.ʒß to f.ʒj or more.

Adulteration. Oil of Spike is sometimes mixed or substituted for the true oil; oil of turpentine may also be mixed with it.

Mentha Piperita *Lond.* The recent and dried flowering plant, Mentha Piperita, Peppermint; Lin. Syst., Didynamia gymnospermia; indigenous, growing in damp places.

Menthæ Piperitæ Oleum *Lond.* The oil distilled from the flowering plant.

Prop. & Comp. The whole plant owes its virtues to the presence of the *volatile oil*, Menthæ Piperitæ Oleum, which is greenish-yellow; sp. gr. 0·92. Composition ($C_{21}\,H_{20}\,O_2$) or ($4\,C_5\,H_4 + 2\,HO + O_2$.)

Off. Prep. AQUA MENTHÆ PIPERITÆ, LOND. Peppermint Water. (Peppermint, dried, ℔ij; water, 2 gallons. Let a gallon distil. If the fresh herb be employed, double the weight must be used. This water may be more quickly prepared from oil of peppermint, in the same manner as the dill water.)

SPIRITUS MENTHÆ PIPERITÆ, LOND. Spirit of Peppermint. (Oil of peppermint, f.ʒiij; proof spirit, a gallon. Dissolve.)

Therapeutics. Stimulant and carminative; used as an adjunct to purgatives, to correct flatulence, &c.

Dose. Of the oil, ♏iij to ♏x; of the aquæ menthæ pip., f.℥j to f.℥ij; of spirit. menthæ pip., f.ʒß to f.ʒj.

Mentha Viridis *Lond.* The recent and dried flowering plant, Mentha Viridis, Spearmint; Lin. Syst., Didynamia gymnospermia; indigenous, growing in marshy places.

Menthæ Viridis Oleum *Lond.* The oil distilled from the flowering plant.

Prop. & Comp. The plant owes its virtues to the *volatile oil,* Menthæ Viridis Oleum, which has the composition (C_{35} H_{28} O) or (7 C_5 H_4 + O), and sp. gr. 0·914.

Off. Prep. AQUA MENTHÆ VIRIDIS, LOND. Spearmint Water. (Prepare this in the same manner as has been directed for Peppermint Water.)

SPIRITUS MENTHÆ VIRIDIS, LOND. Spirit of Spearmint. (Oil of spearmint, f.ʒiij; proof spirit, a gallon. Dissolve.)

Therapeutics. As Mentha Piperita.

Dose. The same as of the corresponding preparations of Mentha *piperita.*

Pulegium *Lond.* The recent and dried flowering plant, Mentha Pulegium, or Pennyroyal; Lin. Syst., Didynamia gymnospermia; indigenous, growing in marshy places.

Pulegii Oleum *Lond.* The oil distilled from the flowering plant.

Prop. & Comp. Oil of Pulegium is yellowish, sp. gr. 0·95. Composition (C_{10} H_8 O) or (2 C_5 H_4 + O.)

Off. Prep. AQUA PULEGII, LOND. Pennyroyal Water. (Prepare this in the same manner as has been directed for Peppermint Water.)

SPIRITUS PULEGII, LOND. Spirit of Pennyroyal. (Oil of pennyroyal, f.ʒiij; proof spirit, a gallon. Dissolve.)

Therapeutics. As Mentha Piperita.

Dose. The same as of the corresponding preparations of Mentha Piperita.

Two other plants belonging to this order, namely, ORIGANUM VULGARE, the Common Marjoram, containing a volatile oil, and possessing properties similar to those of Rosmarinus; and MARRUBIUM VULGARE, or Horehound, possessing a bitter principle as well as volatile oil, were formerly contained in the Pharmacopœia; the latter is still used in domestic medicine as tonic, expectorant, and alterative, in phthisis, chronic hepatitis, and in cachexia from various causes.

SUB-CLASS IV. APETALÆ.

POLYGONACEÆ.

Rheum (Sinense) *Lond.* Rhubarb (Chinese). The root of uncertain species of Rheum; Lin. Syst., Enneandria Monogynia; growing in Chinese Tartary, &c. The London College, by the term *Chinese* Rhubarb, includes the Russian or Turkey, the East Indian and Dutch-trimmed or Batavian rhubarbs. Many species of Rheum are known to botanists, but although great exertions have been made, as yet the species yielding the Chinese rhubarb has not been discovered: it grows in Thibet.

Description. *Russian* or so-called *Turkey* rhubarb occurs in irregular-shaped, flat, or cylindrical, angular pieces, the cortex having been removed by slicing; externally it is smooth and yellow; the texture is compact; the fracture uneven, and marbled red and white; the powder is bright buff-yellow, and odour rather aromatic; taste astringent and disagreeable: it feels gritty, and tinges the saliva bright yellow; the pieces have generally a hole drilled in them.

East Indian, or Chinese, or half-trimmed rhubarb, differs from the last in not being angular, but slightly rounded, with adhering portions of the cortex, as if it had been scraped and sliced; externally it is red and veined, not covered with yellow powder, as the Russian variety; also denser, smoother fracture, less gritty, and the powder of a redder hue.

Another variety is called *Dutch-trimmed* or *Batavian* rhubarb; in round or flattened pieces, angular, and drilled with a hole; probably of the same origin as the Russian.

Besides these officinal varieties, others are met with, as the *Himalayan, Canton stick* and *English* rhubarb. Some of the Himalayan, according to Dr. Royle, is yielded by *Rheum Emodi, Morecroftianum,* and *Webbianum*; the English variety is derived from *Rheum Rhaponticum.*

Prop. and Comp. Rhubarb contains a principle, *Rheine.* This is identical with *chrysophanic acid,* a crystallisable principle, of some stability; various resins also have been obtained from it, phœnotin, erythoretin, &c; but although numerous analyses have been made, the peculiar purgative principle has not yet been isolated. Rhubarb yields its active properties to boiling water, also to alcohol. Crystals of oxalate of lime are found in it in considerable quantities.

Off. Prep. EXTRACTUM RHEI, LOND. Extract of Rhubarb.

(Powdered rhubarb, ℥xv; proof spirit, Oj; distilled water, Ovij. Macerate for four days; then strain and set by, that the dregs may subside. Pour off the liquor, and evaporate to a proper consistence.)

INFUSUM RHEI, LOND. Infusion of Rhubarb. (Sliced rhubarb ʒiij; boiling distilled water Oj. Macerate for two hours in a closed vessel, and strain.)

PILULA RHEI COMPOSITA, LOND. Compound Rhubarb Pill. (Rhubarb, powdered, ʒiv; socotrine aloes, powdered, ʒiij; myrrh, powdered, ʒij; soft soap ʒß; oil of carraway ♏xv; treacle, as much as may be necessary. Mix the powders together, add the remaining ingredients, beat all together, and form a mass.)

TINCTURA RHEI COMPOSITA, LOND. Compound Tincture of Rhubarb. (Rhubarb sliced, ℥ijß; fresh liquorice, bruised, ʒvj; ginger bruised, saffron, each, ʒiij; proof spirit, Oij. Macerate for seven days; then press and strain.)

PULVIS RHEI COMPOSITUS, EDIN. (Gregory's Powder.) Compound Rhubarb Powder. (Magnesia, ℔j; ginger, in fine powder, ℥ij; rhubarb, in fine powder, ℥iv. Mix them thoroughly, and preserve the powder in well-closed bottles.)

Therapeutics. Rhubarb acts as a stomachic and slight astringent in small doses; as a purgative, in larger ones. Its purgative action is generally followed by constipation, dependent on its astringent constituents; it differs from many cathartics in not causing irritation of the alimentary canal. The urine becomes coloured by it, as also do the perspiration and the milk. In consequence of its purgative properties it is often used at the commencement of diarrhœa depending on the presence of irritant matter in the canal, which is thus expelled, and the subsequent astringent effect afterwards exercised proves very valuable. It is frequently combined with magnesia, especially when given to children, as in the form of Gregory's powder. In cases of atonic dyspepsia, attended with some constipation, it is a valuable remedial agent; but if prescribed in cases of habitual constipation, should be combined with some other laxative. In scrofulous children it is sometimes useful with a mercurial alterative, aiding and giving tone to the digestive organs, &c. Externally it has been applied to indolent ulcers.

Dose. Of infusion, f.℥j to f.℥ij: of the tincture, as a stomachic, f.ʒj to f.ʒij; as a purgative, f.℥ß to f.℥j: of compound rhubarb pill, gr. x to ℈j; of the compound powder, gr. v to gr. x for children.

MYRISTACEÆ.

Myristica *Lond.* The seed, stripped off the shell, of Myristica Moschata, or Nutmeg Tree; Lin. Syst., Diœcia Monodelphia; growing chiefly in the Moluccas.

Myristicæ Oleum *Lond.* A concrete oil expressed from the seed.

Description. The nutmeg is of a spheroidal shape, resembling that of a small bird's egg, of a greyish colour externally, and reddish-brown internally. The cut surface presents a mottled appearance, produced by numerous veins in which the oil is situated.

Prop. & Comp. By expression nutmegs yield about 30 per cent. of the officinal oil, consisting of a *fixed oil* or *fat*, united with a *volatile oil*, which last, when separated, is of a pale yellow colour, sp. gr. 0·95, possessing the odour and flavour of the nutmeg. The fixed fat yields a peculiar acid, *sericic* ($C_{28} H_{28} O_3 + HO$), crystallising in silky needles. Nutmeg contains, besides these principles, woody fibre, and the ordinary constituents of seeds.

Off. Prep. SPIRITUS MYRISTICÆ, LOND. Spirit of Nutmeg. (Nutmegs, bruised, ℥ijß; proof spirit, a gallon; water, Oj. Mix them, and distil a gallon over a slow fire.)

The volatile oil is officinal in the Edinburgh and Dublin Pharmacopœias; was formerly so in the London. The Oleum Myristicæ, *Lond.*, forms a part of Emplastrum Picis. The nutmeg is contained in Confectio Aromatica, and Tinctura Lavandulæ C. The spirit is used in the preparation of Mistura Ferri Composita.

Therapeutics. Nutmeg is an aromatic, and gentle stimulant. In very large doses it is said to possess narcotic properties. It is perhaps more frequently used for giving flavour to farinaceous and other articles of food, than for its medicinal properties. Applied externally, it acts as a topical stimulant.

Dose. Of nutmeg, in powder, gr. v to gr. xv; of the spiritus myristicæ, f.ʒj to f.ʒij.

LAURACEÆ.

Cinnamomum *Lond.* The bark of Cinnamomum Zeylanicum, or Cinnamon; Lin. Syst., Enneandria Monogynia; growing chiefly in Ceylon.

Cinnamomi Oleum *Lond.* The Oil of Cinnamon, distilled from the bark.

Description. The bark occurs in compound quills, about as thick as cartridge-paper, and 3 feet in length; the colour is a characteristic brown; brittle, and splintery fracture; aromatic odour, and warm astringent taste. The *oil* is of a bright yellow colour, with the odour and taste of the bark.

Prop. & Comp. The bark contains the *oil*, oleum cinnamomi ($C_{18}\ H_7\ O_{21},\ H$), which, on exposure, oxidates, and cinnamic acid ($C_{18}\ H_7\ O_3 + HO$) and some resinous matters are formed; besides this oil, *tannin* is present in notable quantities, also *resin*, and *cinnamic acid*, &c.

Off. Prep. Of the Bark. Aqua Cinnamomi, Lond. Cinnamon Water. (Prepare in the same manner as directed for Aqua Anethi.)

Pulvis Cinnamomi Compositus, Lond. Compound Cinnamon Powder. (Cinnamon, ℥ij; cardamoms, ℥jß; ginger, ℥j; long pepper, ℥ß. Rub together to a very fine powder.)

Tinctura Cinnamomi, Lond. Tincture of Cinnamon. (Cinnamon, bruised, ℥iijß; proof spirit, Oij. Macerate for seven days, then press and strain.)

Tinctura Cinnamomi Composita, Lond. Compound Tincture of Cinnamon. (Cinnamon, bruised, ℥j; cardamoms, bruised, ℥ß; long pepper powdered, ginger, bruised, each ʒijß; proof spirit, Oij. Macerate for seven days, press and strain.)

Of the Oil. Spiritus Cinnamomi, Lond. Spirit of Cinnamon. (Oil of cinnamon, f.ʒij; proof spirit, a gallon. Dissolve.) Cinnamon water is also sometimes made from the oil.

Cinnamon forms a compound of many astringent and stimulant pharmaceutical preparations.

Therapeutics. Cinnamon is stimulant, aromatic, and carminative, also somewhat astringent; useful as an adjunct in diarrhœa. The oil may be employed in flatulence, and as a corrigent to purgatives.

Dose. Of the powdered bark, gr. x to ʒß; of aqua cinnamomi, f.ʒj to f.ʒij; of pulv. cinnamomi comp., gr. x to ʒß; of

the tinctures, f.ʒj to f. ʒij; of oleum cinnamomi, ♏ij to ♏vj; of spiritus cinnamomi, f.ʒj to f. ʒij.

Adulteration. The bark called Cassia, from Cinnamomum Cassiæ, detected by its greater thickness and roughness, and less aromatic odour and taste: this bark is officinal in the Edinburgh Pharmacopœia, as are also the *preparations* corresponding to those of true cinnamon.

Camphora *Lond.* A purified concrete substance, prepared by sublimation from the wood of Camphora Officinarum; Lin. Syst., Enneandria Monogynia; growing in China, Japan, &c.

Description. Camphor is usually sublimed in the form of hollow hemispherical cakes, and these are broken into small masses, which are crystalline, white, semitransparent, of peculiar odour and taste, known by the name of camphoraceous. Crude camphor, as imported, is in the form of small crystalline grains, of a dirty white colour; this is mixed with lime, and sublimed.

Prop. & Comp. Camphor is rather tough and difficult to pulverise, except when a few drops of spirit are added; sp. gr. 0·98. It is soluble in alcohol, ether, the volatile and fixed oils; little so in water, yet sufficient is taken up to give a strong taste and odour to that liquid. It has the nature of a concrete volatile oil, and its formula is ($C_{10}H_8O$). It is changed into camphoric acid by nitric acid.

Off. Prep. Linimentum Camphoræ, Lond. Camphor Liniment. (Camphor ℥j; olive oil, f.℥iv. Dissolve.)

Linimentum Camphoræ Compositum, Lond. Compound Camphor Liniment. (Camphor ℥ijß; oil of lavender, f.ʒj; rectified spirit, f.℥xvij; stronger solution of ammonia, f.℥iij. Dissolve the camphorated oil in the spirit, then add the ammonia, and shake them well until they are mixed.)

Mistura Camphoræ, Lond. Camphor Mixture. (Camphor ʒß; rectified spirit ♏x; distilled water, Oj. First rub the camphor with the spirit; then, with the water gradually poured in, strain through linen.)

Spiritus Camphoræ, Lond. Spirits of Camphor. (Camphor ℥v; rectified spirit, Oij. Dissolve.)

Tinctura Camphoræ Composita, Lond. Compound Tincture of Camphor. (Camphor ℈ijß; powdered opium, benzoic acid, each, grs. lxxii; oil of aniseed, f.ʒj; proof spirit, Oij. Macerate for seven days, and strain.)

Therapeutics. Stimulant at first, afterwards sedative; its action is exerted on the brain and nervous system, also upon the

skin and mucous membranes. Externally it acts as a stimulant. Used in mania and melancholia as a calmative; in hysterical and other spasmodic nervous affections as an anti-spasmodic; in painful affections of the urinary organs, and dysmenorrhœa, as a sedative; and in febrile conditions, the exanthemata, rheumatism, &c., as diaphoretic. Externally, it is employed to stiff and painful parts.

Dose. Of camphor, gr.v upwards; of camphor mixture, f.℥j to f.℥iij; of the spirits, ♏x to ♏xxx, suspended in water (which precipitates it) by means of mucilage; of the compound tincture, f.ʒj upwards; each f.ʒj contains about ¼ grain of opium.

Adulteration. Camphor is not often adulterated, but another kind, called Borneo Camphor, from Dryobalanops Camphora, a guttiferous plant, is sometimes met with; heavier than water, less volatile, and more opaque than true camphor. An artificial camphor can be made by passing hydrochloric acid gas through volatile oil of turpentine.

Sassafras *Lond.* The root of Sassafras Officinale, or Sassafras tree; Lin. Syst., Enneandria Monogynia; growing in the United States and Canada.

Description. In branched pieces; the wood, light and spongy, of a pale brown colour; the bark, dark reddish-brown, also spongy; odour agreeable; taste warm, sweet, and aromatic; the bark is more powerful than the wood.

Prop. & Comp. Sassafras root contains a *volatile oil, resin,* and a principle called *sassafrin,* with a little tannin, &c.

Off. Prep. It is contained in Decoctum Sarzæ Compositum, *Lond.*

Therapeutics. A stimulant and diaphoretic, seldom given alone; the volatile oil, Oleum Sassafras, *Edin.,* may be employed. Used in chronic rheumatism, skin diseases, and syphilis.

Dose. Of the oil, ♏v, upwards.

Laurus *Lond.* The fruit of Laurus nobilis, or Sweet Bay; Lin. Syst., Enneandria Monogynia; growing in the South of Europe, cultivated in this country.

Description. The fruit is ovoid, about the size of a small cherry, wrinkled; dark brown or purple colour; consisting of a

friable sarcocarp, inclosing two oval fatty cotyledons; the odour is aromatic, and the taste warm. Bayberry leaves were formerly used in medicine; they are still employed by the confectioner.

Prop. & Comp. Bayberries contain a *volatile oil,* together with a *fixed fatty oil;* when pressed, both these are separated, and called Oil of Bays.

Off. Prep. Used in the preparation of Confectio Rutæ, and Emplastrum Cumini.

Therapeutics. Slightly stimulant and aromatic.

Adulteration. It is worthy of note, that the leaves of Laurus Cerasus, or Cherry Laurel, order Amygdalaceæ, yielding prussic acid, have been substituted for the bay-laurel leaf, a dangerous exchange.

Bebeeru, or **Bibiri Bark,** obtained from Nectandra Rodiei, or Green-heart tree; growing in Guiana.

Description. It is found in flat pieces, about ⅓ inch thick, heavy, hard and fibrous; of a greyish-brown colour externally, reddish-brown within; taste very bitter.

Prop. & Comp. Contains an alkaloid, not yet crystallised, Bebeerine, or Bibirine ($C_{38}\,H_{21}\,N\,O_6$), a yellow resinous-looking body; soluble in alcohol, slightly in ether, scarcely in water; forms salts: the commercial one is the impure sulphate, in dark brown glittering slabs; sparingly soluble in water, much more so in acid solutions.

Therapeutics. Tonic and antiperiodic; used in debility and periodic affections, it has been found but an imperfect substitute for quinine.

Dose. Of the sulphate of bibirine, gr. iij to gr. x or more.

ARISTOLOCHIÆ.

Serpentaria *Lond.* The root of Aristolochia Serpentaria, Serpentary, or Virginian Snake-root; Lin. Syst., Gynandria Hexandria; grown in Virginia and other parts of the United States.

Description. A small rootstock with numerous small radicles, of a pale greyish-brown colour; aromatic and camphoraceous odour and taste, which is also bitter.

Prop. & Comp. Serpentary contains a *volatile oil* and *resin;* also a *bitter extractive* matter; the latter soluble in water, the former in spirit.

Off. Prep. INFUSUM SERPENTARIÆ, LOND. Infusion of Serpentary. (Serpentary ℥ß; boiling distilled water Oj. Macerate for four hours in a closed vessel, and strain.)

TINCTURA SERPENTARIÆ, LOND. Tincture of Serpentary. (Serpentary, bruised, ℥iiiß; proof spirit, Oij. Macerate for seven days, then press and strain.)

Serpentary is contained also in Tinct. Cinchonæ Comp.

Therapeutics. A stimulant and tonic; also diaphoretic and diuretic. It is sometimes used in atonic dyspepsia, chronic rheumatism, in low febrile states, and to promote eruption in the exanthemata.

Dose. Of the powdered root, gr. x to ʒß, or more; of the infusion, f.℥j to f.℥ij; of the tincture, f.ʒj to f.ʒij.

ASARUM EUROPÆUM, or ASARABACCA, belongs to this order: the leaves were formerly used as an errhine; they cause powerful vomiting and purging when administered internally.

THYMELACEÆ.

Mezereum *Lond.* The bark of the root of Daphne Mezereum, or Mezereon; Lin. Syst., Octandria Monogynia; indigenous.

Description. Thin, flat, or curled pieces, of a brown colour outside, but white and fibrous within, with slight odour, taste sweetish but very acrid.

Prop. & Comp. An *acrid volatile oil, acrid resin,* and a crystalline principle, *daphnin.* When the root is boiled in water, an acrid vapour rises.

Off. Prep. It is contained in DECOCTUM SARZÆ COMPOSITUM, LOND. The Dublin College orders a decoction of Mezereon. (ʒij of mezereon root-bark; ℥j of liquorice; water, Oij. Boil to Ojß.)

Therapeutics. Mezereon is a powerful local irritant, and even vesicant; it causes vomiting and purging in large doses, but in small ones, diaphoresis and diuresis. Used in chronic rheumatism, syphilis, scrofulous and skin diseases. Seldom given in this country, except in the compound decoction of sarsaparilla. In America an ointment is used.

Dose. Of decoction of mezereon, *Dub.* f.℥j to f.℥ij, or more.

EUPHORBIACEÆ.

Cascarilla *Lond.* The bark of Croton Eleuteria, or Cascarilla bush; Lin. Syst., Monœcia Monodelphia; growing in the Bahamas.

Description. In small quilled pieces, from two to four inches long, and about the size of a pencil, fissured in both directions, of a light brown colour, but spotted white with lichens; short fracture; sometimes it occurs in small flattened pieces without lichens.

Prop. & Comp. Odour spicy and pleasant, taste bitter and aromatic; these properties are yielded to water and spirit. The bark contains a bitter matter, in which a crystalline substance, *Cascarilline,* has been stated to exist; besides which, there are present some tannin, colouring matter, and a *volatile oil.*

Off. Prep. INFUSUM CASCARILLÆ, LOND. Infusion of Cascarilla. (Cascarilla, bruised, ℥jß; boiling distilled water, Oj. Macerate for two hours in a covered vessel, and strain.)

TINCTURA CASCARILLÆ, LOND. Tincture of Cascarilla. (Cascarilla, bruised, ℥v; proof spirit, Oij. Macerate for seven days, then press and strain.)

Therapeutics. An aromatic stomachic and tonic: useful in atonic dyspepsia, and in recovery from acute diseases; it seems also to possess antiperiodic powers, but is much less powerful than Cinchona; and is now seldom employed in intermittents.

Doses. Of powdered bark, gr. x to ʒß; of the infusion, f.℥j to f.℥ij; of the tincture, f. ʒß to f.ʒij.

Tiglii Oleum *Lond.* Croton Oil, or the oil expressed from the seed of Croton Tiglium; Lin. Syst., Monœcia Monodelphia; growing in the East Indies.

Description. The oil is viscid, from pale yellow to brownish-red in colour, of a disagreeable odour and acrid taste. The seeds from which the oil is expressed are smaller, duller in appearance, but otherwise much resemble castor oil seeds. The kernels yield from 50 to 60 per cent. of oil.

Prop. & Comp. Croton oil contains a volatile oily acid, *Crotonic acid* (not active), and a fixed oil. It is soluble in ether and volatile oils; also for the most part in alcohol (but in this respect Croton oils differ, that expressed in England being quite soluble).

Therapeutics. A most powerful irritant, drastic, purgative, often causing nausea and vomiting; used in obstinate constipation, and in cerebral affections, as apoplexy; also in very minute quantities as an ordinary purgative. Externally it gives rise to fine pustulation, and is a valuable counter-irritant diluted with olive oil or soap liniment.

Dose. Of the oil ♏$\frac{1}{2}$ to ♏ij, placed on the tongue; or formed into a pill with crumb of bread. As an adjunct, ♏$\frac{1}{12}$ upwards.

Adulteration. Other fixed oils, as castor oil, might be added, which would be difficult to detect.

Ricini Oleum *Lond.* Castor Oil, prepared by heat or pressure from the seed of Ricinus Communis, the Castor Oil plant; Lin. Syst., Monœcia Monodelphia; growing in the East and West Indies, in Southern Europe, and Africa. That called *cold drawn* comes from the East Indies.

Description. The oil is thick, viscid, very pale, sometimes yellow, of peculiar odour, and slightly acrid taste. The seeds, about the size of small beans, are oval, compressed, obtuse at the ends, smooth and shining on the surface, of a light ash colour, marbled with dark spots and veins.

Prop. & Comp. Differs from most other fixed oils in being quite soluble in alcohol; sp. gr. 0·96; it contains three oily acids, *Ricinic*, *Ricin-oleic*, and *Ricin-stearic*, united with *Glycerine.* It also contains some acrid resinous matter.

Therapeutics. A mild, yet quick purgative medicine; causing little or no disturbance of the system; only the evacuation of the contents of the bowels. Used in delicate subjects, and in irritable conditions of the alimentary canal, and neighbouring parts; as in gastritis, enteritis, and dysentery, cystitis, &c. The seeds are very active, even dangerous.

Dose. f.ʒj to f.℥j; often given floating on some liquid; sometimes in gelatine or membranous capsules; or in the form of an emulsion with some aromatic.

Adulteration. Other fixed oils, difficult to detect, as they are thus rendered soluble in alcohol.

In this order are also contained the—

Euphorbium Officinarum, yielding the whitish tears of resin called *Euphorbium*, a very powerful local irritant, used sometimes as a sternutatory, causing violent vomiting and purging when swallowed; it is officinal in the Edinburgh Pharmacopœia: also the *Janipha* or *Jatropha Manihot*, of which the fecula of the

root, when dried and heated, forms *Tapioca*. Cassava bread is also made from the root; the juice of the tree, when fresh, is acrid and poisonous. Tapioca is made officinal by the Edinburgh and Dublin Colleges, and is a pure form of starch, used much as a food.

PIPERACEÆ.

Piper Nigrum *Lond.* The unripe fruit of Piper Nigrum, or Black Pepper; Lin. Syst., Diandria Trigynia; growing in tropical Asia, chiefly imported from Java and Sumatra.

Description. A berry about the size of a small pea, black, rough or wrinkled on the outside, white within; when decorticated it forms *white pepper.*

Prop. & Comp. Odour hot and pungent; taste acrid; contains a nitrogenised neutral principle, *Piperine* ($C_{70} H_{37} N_2 O_{10}$), in rhomboidal prisms, white, almost tasteless, and inodorous (the piperine of commerce is always yellow and acrid from volatile oil), and a *volatile oil* ($C_{10} H_8$), lighter than water, giving the odour and taste to the drug: there exists, also, some acrid resin, besides the ordinary constituents of such fruits.

Off. Prep. CONFECTIO PIPERIS, LOND. Confection of Pepper. (Black pepper, elecampane, each ℔j; fennel, ℔iij; honey, sugar, each ℔ij. Rub the dry ingredients together to a very fine powder, and keep them in a covered vessel. Whenever the confection is to be used, add by degrees the powder to the honey, and beat until thoroughly incorporated.)

This preparation is a substitute for a nostrum long known as Ward's Paste, and much used in the treatment of piles.

Black Pepper is also contained in Confectio rutæ.

Therapeutics. Chiefly used as a condiment. It acts as a stimulant stomachic, and appears to influence the mucous membrane of the rectum, hence its value in hæmorrhoids; it also acts on the urethral membrane, and may substitute cubebs in gonorrhœa, &c. Piperine, and hence pepper, probably possess antiperiodic powers, and have been used with success in agues. Externally, pepper, or its oil, may be employed as a rubefacient; the oil, in relaxed sore throat.

Dose. Of piperine, gr. v upwards; of pepper, gr. v to ℈j; of the confection, ʒj to ʒij or more.

Piper Longum *Lond.* The unripe fruit of Piper Longum,

or Chavica Roxburghii; Lin. Syst., Diandria Trigynia; chiefly from Bengal and other parts of Hindostan.

Description. The spikes are from one or two inches in length, and studded with eminences arranged spirally; of a light grey colour.

Prop. & Comp. As black pepper; the odour being rather different.

Off. Prep. Forms a part of Confectio Opii; Pulvis Cinnamomi C.; Pulvis Cretæ C., and Tinct. Cinnamomi C.

Therapeutics & Doses. As black pepper.

Cubeba *Lond.* The unripe fruit of Piper Cubeba or Cubeba Officinalis, the Cubeb Pepper; Lin. Syst., Diandria Trigynia; coming chiefly from Java.

Description. Very like black pepper, but have small stalks or tails attached, which serve to distinguish them; also lighter in colour.

Prop. & Comp. Odour like camphor, in addition to pepper; taste, hot and spicy; contains *Cubebine,* which by some is said to be the same as piperine; but this is doubtful: a *volatile oil* ($C_{15}H_{12}$), pale green in colour, lighter than water. Cubebs also contain resin, &c.

Off. Prep. Tinctura Cubebæ, Lond. Tincture of Cubebs. (Cubeb, powdered, ℔j; proof spirit, Oij. Macerate for seven days, then press out and strain.)

The volatile oil, Oleum Cubebæ, is made officinal by the Edinburgh and Dublin Colleges.

Therapeutics. Used almost exclusively for its action on the mucous membrane of the urethra and bladder, upon which it is a stimulant; it has the power of arresting abnormal discharges.

Dose. Of the powder, ℈j to ʒij; of the tincture, ʒß to ʒij; of the volatile oil, ♏v to ♏xxx.

Matico *Dub.* The leaves of Artanthe Elongata or Piper Angustifolium, Matico plant; Lin. Syst., Diandria Trigynia; a native of Peru.

Description. The leaves are green, oblong lanceolate, acuminate, tesselated on the upper surface, reticulated and downy beneath; as imported, the leaves are mixed with the spikes and stalks, and in a compressed state.

Prop. & Comp. The leaves have an aromatic odour and

taste, but no astringency; they contain a *volatile oil*, a bitter principle called *Maticine*, colouring matter, &c.

Off. Prep. INFUSIO MATICO, DUB. (℥ß of leaves to Oß of water.) TINCTURA MATICO, DUB. (℥iv of leaves to Oj of proof spirit.)

Therapeutics. The surface of the leaf or the powder applied to bleeding parts, as leech-bites, &c., is stated to act as a powerful styptic; when given internally it is supposed to affect the genito-urinary mucous membrane and rectum, like pepper or cubebs; it contains no ordinary astringent matter, and probably its power, when applied topically, is due to the mechanical structure of the leaf.

Dose. Of powder, internally, ʒß to ʒj; of infusion, f. ℥j to f. ℥ij; of tincture, f. ʒj to f. ʒij.

SALICACEÆ.

Salicis Cortex *Edin.* Bark of Salix Caprea, Willow Bark; Lin. Syst., Diœcia Diandria; indigenous.

Description. The bark obtained from the branches is quilled, the epidermis dark-coloured, and the structure fibrous and tough; it has a slightly aromatic odour, with a bitter and astringent taste.

Prop. & Comp. Its active matters are soluble in water; it contains *tannin*, gum, extractive matter, and the usual constituents of barks. In addition, it also yields a neutral crystalline principle *Salicine*, which, when pure, occurs in white scaly crystals, of a bitter taste, soluble in water and alcohol; formula ($C_{26}\,H_{18}\,O_{14}$). Concentrated sulphuric acid turns it of a bright red colour; and when acted on by oxidising agents, it is converted into *Salicylous acid*, or hydruret of Salicyle ($C_{14}\,H_5\,O_4\,H$); this is identical with the *oil of Spiræa Ulmaria*, and exhales the same peculiar odour.

Therapeutics. Willow bark is tonic and antiperiodic, and has been much recommended in intermittents as a substitute for cinchona; it is generally administered as salicine; this is thought to possess considerable antiperiodic power, but is not likely to supersede quina, though useful as a mild bitter tonic, when given in doses from gr. x to ℈j. The decoction is sometimes useful in chronic skin affections, as psoriasis. Salicine taken internally appears in the urine as the hydruret of salicyle, and causes that fluid to strike purple-red with the persalts of iron.

Dose. Of decoction, f. ℥jß to f. ℥iij; of salicine, gr. x to ʒß.

ULMACEÆ.

Ulmus *Lond.* The inner bark of Ulmus Campestris; Lin. Syst., Pentandria Monogynia; Elm Bark; native of Europe.

Description. It occurs in pieces, which are of a lightish-brown colour, with a somewhat astringent taste; the pieces are broad and thin, and consist of the bark, deprived of its epidermis and outer layer.

Prop. & Comp. It yields its active properties to water, and contains a large amount of mucilage, and about 2·7 per cent. of tannin. *Ulmine,* a peculiar substance, of dark brown colour, insoluble in cold, and but slightly so in boiling water, which it tinges of a brown colour, readily soluble in alkaline solutions, received its name from being first obtained from this bark; it is now thought to be a constituent of many others.

Off. Prep. DECOCTUM ULMI, LOND. Decoction of Elm. (Bruised elm bark ℥ij; distilled water Oij. Boil down to a pint, and strain.)

Therapeutics. Elm bark is demulcent, slightly tonic and astringent, and has been recommended in some chronic skin affections, as psoriasis and lepra. Some practitioners think highly of its powers as an alterative; sometimes diuretic and diaphoretic effects are produced by the use of the decoction.

Dose. Of the decoction f.℥j to f.℥ij.

CUPULIFERÆ.

Quercus *Lond.* The bark of Quercus Pedunculata, the Common Oak; Lin. Syst., Monœcia Polyandria; indigenous.

Description. The bark, when dry, occurs in long pieces generally covered with a greyish-white epidermis, of a fibrous consistence, internally brown; so also is the outer surface, when denuded of the epidermis; the taste is very astringent.

Prop. & Comp. Oak bark yields to water and spirit its active principles, viz., *tannin,* some *gallic* acid, it contains also *pectin.* The amount of tannin varies very much with the age of the branches from which the bark is taken, season, and other circumstances.

Off. Prep. DECOCTUM QUERCUS, LOND. Decoction of Oak Bark. (Bruised oak bark ℥x; distilled Oij. Boil down to a pint, and strain.)

Therapeutics. Seldom used except as an external astringent, in the form of the decoction, which forms a useful and economical lotion, gargle, or injection, in relaxed sore throat, leucorrhœa, &c. It may be given internally in the cases where tannin is useful.

Dose. Of decoction, f.℥j to f.℥ij, when internally administered.

Galla *Lond.* The Nut-Gall, a swelling occurring on the small twigs of Quercus Infectoria, the Gall or Dyer's Oak; Lin. Syst., Monœcia Polyandria; growing chiefly in Asia Minor.

Acidum Tannicum *Lond.* An acid prepared from the gall-nut.

Acidum Gallicum *Lond.* An acid prepared from the gall-nut.

Description. The puncture of the young twig of the tree by a hymenopterous insect, the *cynips gallæ tinctoriæ*, causes an astringent exudation, which concretes and produces the gall-nut; the eggs deposited by the insect become enclosed in the excrescence. Gall-nuts are more or less globular in form, tuberculated on the surface, about the size of a marble. There are two varieties, blue and white galls; the former, heavy and of a bluish-green tinge; the latter, white, of a greyish colour, less astringent, and perforated with a small hole, the passage by which the insect escaped.

Tannin and *gallic acid* are described below.

Prop. & Comp. Gall-nuts contain a very large amount, about 35 per cent., of *tannin* or *tannic acid*, and 5 per cent. of *gallic acid*, also another body named *ellagic acid*, with gummy and extractive matters, lignin, salts, &c.

Tannin or *tannic acid*, obtained by percolating the bruised galls with hydrous ether, occurs, when pure, in the form of a light glistening spongy mass or powder, yellowish or almost white, uncrystallisable, of a very astringent taste, freely soluble in water or spirit, but very sparingly so in ether, slightly acid in reaction; its solutions precipitate gelatine, albumen, starch, the alkaloids, and many of the inorganic bases, and strike bluish-black with the persalts of iron. According to the latest researches of Strecker, tannin has the formula (C_{54} H_{22} O_{34}), and by the action of sulphuric acid is resolved into gallic acid and grape sugar. The same change is effected where a strong

decoction of the galls is kept for a lengthened period at a temperature of about 70° or 80° Fah. The formula explaining the decomposition is thus represented by Strecker:
[$(C_{54}H_{22}O_{34}) + 8HO = 3(C_{14}H_{6}O_{10}) + (C_{12}H_{10}O_{10})$] or 1 equivalent of tannin and 8 of water are resolved into 3 equivalents of gallic acid and 1 of grape sugar.

Gallic Acid, formed by either of the two processes above indicated, occurs in white silky needles; much less soluble in water and alcohol than tannin, but soluble in ether: it differs also from tannin in not precipitating gelatine, albumen, or the alkaloids, but strikes bluish-black with the persalts of iron; its taste is acid and astringent, but much less so than that of tannin, perhaps owing to its slight solubility in the saliva. Strecker considers it a tribasic acid, having the formula ($C_{14}H_{3}O_{7} + 3HO$). Both tannic and gallic acids are decomposed by heat, with the formation of *pyrogallic acid* ($C_{6}H_{3}O_{3}$) and metagallic acid ($C_{6}H_{2}O_{2}$). The former acid strikes black with proto-salts of iron, and is a powerful deoxidising agent.

Ellagic Acid exists in gall-nuts in small quantities; it forms a white powder, differing from tannin and gallic acid in being almost insoluble in water, alcohol, or ether; it appears to be an isomeric modification of gallic acid. Probably ellagic acid is contained in many vegetables, as some of the intestinal concretions, called *bezoars*, found in the intestines of ruminants, are entirely composed of it.

Off. Prep. Decoctum Gallæ, Lond. Decoction of Gall-Nuts. (Bruised galls ℥ijß; distilled water, Oij. Boil down to a pint, and strain.)

Tinctura Gallæ, Lond. Tincture of Gall-Nuts. (Galls, bruised, ℥v; proof spirit, Oij. Macerate for seven days, and strain.)

Unguentum Gallæ Compositum, Lond. Compound Ointment of Gall-Nuts. (Gall-nuts, very finely powdered, ʒvj; lard ℥vj; powdered opium ʒjß. Rub together.)

Therapeutics. Gall-nuts owe their efficacy to the tannic and gallic acids contained in them; and the description of the action of these acids applies not only to galls, but to all those vegetables which are made use of for their astringent effects. *Tannin*, when applied to a living part, acts as a most powerful astringent; this effect is well seen, if the surface of a mucous membrane is chosen, in the contraction of the vessels, and consequent paleness produced. When the lips, or any part of the mouth, come in contact with this acid, the astringency becomes evident to the taste. Taken internally, tannin sometimes

causes a sensation of dryness of the mouth and fauces, thirst, and not unfrequently constipation; it soon becomes absorbed into the blood, and after some alteration in composition, is thrown out, or at least partly so, by the kidneys in the form of gallic and pyrogallic acids, and a brownish-black humus-like matter: sometimes the urine becomes quite dark-coloured, especially after it has been exposed to the air for a short time. It does not precipitate gelatine, showing the absence of tannin, but strikes black both with per- and proto-salts of iron, indicating the presence of gallic and pyrogallic acids. Upon the alimentary canal, and also after absorption, the action of tannin is of the same character; and hence, not only topical but remote astringent effects are produced by its administration; and hæmorrhages, as menorrhagia, hæmaturia, and hæmoptysis, increased mucous and other discharges, hectic sweating, diarrhœa, and dysenteric affections, are quickly brought under its influence. *Gallic acid* appears to differ from tannin in its topical action, being less astringent, probably from its comparative little solubility; it, however, becomes absorbed, and the remote effects are identical with those of tannin. Probably as a remote astringent it is more powerful than an equal quantity of tannin, for the latter becomes converted in the blood into gallic acid and grape sugar, and hence part only is available. This was the result obtained from some extensive trials made by the author about nine years since, in the treatment of various forms of hæmorrhages. Externally, the decoction of gall-nuts, or solutions of tannic or gallic acid, may be employed to suppress hæmorrhage, as from the gums, nose, or to any part to which they can be applied; or to lessen discharges from mucous membranes, as in gleet, leucorrhœa, &c.

Dose. Of the decoction of galls, f.℥j to f.℥ij; of the tincture of gall (seldom used, except as a test), f.ʒß to f.ʒjß; of tannin, gr. iij to ℈j; of gallic acid, gr. iij to ℈j, or more; about gr. iv of gallic acid can be dissolved in the f.℥j of water.

URTICACEÆ.

Ficus *Lond.* The Fig, the prepared fruit of Ficus Carica; Lin. Syst., Polygamia Diœcia; a native of Asia.

Description. The part usually known as the fruit of the fig consists of the fleshy pear-shaped receptacle, containing numerous flowers in the interior, attached by fleshy pedicles. These are quite shut in, except at the apex, where a small orifice exists.

When nearly ripe they are dried and exported largely to this country and other parts of Europe.

Prop. & Comp. They contain chiefly saccharine and mucilaginous matters.

Off. Prep. Figs are used in the preparation of Decoctum Hordei Comp. and Confectio Sennæ.

Therapeutics. Demulcent, nutritive, and laxative; used sometimes as an article of diet for this latter property. Heated and split open, they are sometimes used as a cataplasm.

Mori Succus *Lond.* Mulberry Juice; from the fruit of Morus nigra; Lin. Syst., Monœcia Tetandria; native of Persia, cultivated in Europe.

Description. The fruit from which the juice is obtained is of a dark-purple colour, and consists of numerous small berries united together, each containing a single seed, attached to a common receptacle, the fleshy covering of the seeds being formed by the sepals. The juice is of a deep red colour.

Prop. & Comp. The juice has a sweet and acidulous taste, the latter property is said to be due to the presence of tartaric acid.

Off. Prep. Syrupus Mori. Mulberry Syrup. (Mulberry juice, strained, Oj; sugar ℔ijß; rectified spirit, f.℥ijß. Dissolve the sugar in the juice, by a gentle heat, and set by for 24 hours; then remove the scum, and pour off the clear fluid from any dregs, if present; lastly, add the spirit.)

Therapeutics. The juice is refrigerant, and may be used as a drink in febrile diseases. The syrup is also used as a colouring matter.

Dose. Ad libitum.

Cannabis Indica *Dub.* Indian Hemp; Lin. Syst., Diœcia Pentandria; grows in northern parts of India, cultivated in many parts of Europe and America, &c. The extract of Indian Hemp is the officinal preparation in the Dublin Pharmacopœia.

Description. Indian hemp is met with in commerce in three principal forms. The resinous exudation of the leaves and flowers is known as *Churrus;* the plant itself consisting of the stems, leaves, and flowers, packed together lengthwise in long bundles, *Gunjah;* and lastly, a mixture of the leaves and capsules, without the stem, *Bang.* The gunjah is probably equivalent to the *hashish* of the Arabs.

Prop. & Comp. The resin, upon which the peculiar properties depend, is soluble in alcohol and ether, but separates from its solution on the addition of water. The extract in the United States Pharmacopœia is an alcoholic solution of the dried tops evaporated to a proper consistence. This is probably about the same as the purified extract of the Dublin College. The resin mentioned above has received the name *Cannabin*, and has a bitterish taste and peculiar odour; the plant also contains a volatile oil.

Off. Prep. EXTRACTUM CANNABIS INDICÆ PURIFICATUM, DUB. Purified Extract of Indian Hemp. (Extract of Indian hemp, of commerce, ℥j; rectified spirit ℥iv. Dissolve the extract in the spirit, and when the dregs have subsided decant the clear liquid and evaporate, by means of a water-bath, to the consistence of a soft extract.)

TINCTURA CANNABIS INDICÆ, DUB. Tincture of Indian Hemp. (Purified extract of Indian hemp ℥ß; rectified spirit Oß. Dissolve the extract in the spirit.)

Therapeutics. Indian hemp produces a peculiar kind of intoxication, attended with exhilaration of the spirits and hallucinations, said to be generally of a pleasing kind. These are followed by narcotic effects, sleep and stupor. In its anodyne and soporific action it resembles opium, but its after-effects are considered less unpleasant; it does not produce constipation and loss of appetite. Indian hemp possesses antispasmodic and anodyne powers, for which it has been chiefly employed in medicine. It has been administered in the different forms of neuralgia, in spasmodic coughs, as pertussis and asthma, also in tetanus, hydrophobia, and other anomalous spasmodic and painful diseases. Sometimes, but very seldom, it has been used to procure sleep. Much further experience of this drug is required before its real action and value can be fully decided upon; it certainly has disappointed the expectations formed of it when it was first introduced into this country, a circumstance, perhaps, in part due to very inferior hemp having been employed. The urine of patients under its influence sometimes acquires a peculiar odour not very unlike that of the Tonquin bean.

Dose. Of the extract, gr. $\frac{1}{4}$ to gr. 1 or more; of the tincture (Dublin), ♏vj to ♏xxx.

The tincture, when added to water, becomes turbid, from the precipitation of the resin, and hence it should be rubbed up with mucilage, to suspend it, or have a few drops of an alkaline liquid added, to cause its solution.

Lupulus *Lond.* The catkin of Humulus Lupulus, the common Hop; Lin. Syst., Diœcia Pentandria; found in many parts of Europe.

Lupulina *Dub.* Lupuline, the dried powder, separated from the hop, by rubbing and sifting.

Description. The catkin or strobile of the hop is composed of membranous scales, each of which contains at the base two small seeds, surrounded by a yellow granular powder. The scale is covered with numerous superficial glands; it is thin, semi-transparent, veined, and of a yellowish colour when dry, with a peculiar fragrant odour. *Lupuline* is the name given to the fine resinous powder secreted by the scales, and obtained by rubbing and sifting the strobiles; it occurs as a yellowish powder, and has the peculiar flavour of the hop: under the microscope it appears to resemble the pollen of other plants.

Prop. & Comp. Hops contain a *volatile oil*, and a peculiar bitter principle, soluble in alcohol, slightly so in water, but insoluble in ether, called *Lupulite*, or *Humulin*; it is most likely the chief active ingredient. The volatile oil was formerly thought to contain sulphur; this, however, has been lately disproved. The scales themselves contain some lupuline, though in a small proportion. Lupuline yields about 11 per cent. of the bitter principle.

Off. Prep. Of *Hops.*—Infusum Lupuli, Lond. Infusion of Hops. (Hops ʒvj; boiling distilled water, Oj. Macerate for four hours in a closed vessel, and strain.)

Tinctura Lupuli, Lond. Tincture of Hops. (Hops ℥vj; proof spirit, Oij. Macerate for seven days, then press and strain.)

Extractum Lupuli, Lond. Extract of Hops. (Hops ℔ijß; boiling distilled water, 2 gallons. Prepare the extract in the same manner as directed for Extract of Liquorice.)

Of *Lupulina.*—Tinctura Lupulinæ, Dub. Tincture of Lupuline. (Lupulin ℥v; rectified spirit, Oij. Macerate for fourteen days; strain, express, and filter.)

Therapeutics. Hops are tonic and stomachic, diuretic and narcotic. In the form of bitter beer, taken with meals, they form a useful aid to digestion in some cases of atonic dyspepsia. In the form of a pillow, they have been found anodyne and narcotic. The preparations of hop are not much employed, except as adjuncts.

Dose. Of lupulin, gr. v to x; of the infusion of hops, f.℥j to f.℥ij; of the extract, gr. v to ℈j; of the tincture, f.ʒß to f.ʒij.

CONIFERÆ OR PINACEÆ.

Terebinthina *Lond.* Common Turpentine. An oleo-resin, flowing from the trunk (deprived of bark) of Pinus palustris, and Pinus tæda; Lin. Syst., Monœcia Monadelphia; growing in North America.

Terebinthinæ Oleum *Lond.* Rectified oil distilled from Turpentine.

Resina *Lond.* Resin, or Rosin. The residue of the turpentine after the distillation of the oil.

Description. Common or *American Turpentine* has the consistence of treacle, altering much with heat and exposure; of a pale yellow colour; peculiar characteristic odour and taste.

Oil of Turpentine, called also Spirits of Turpentine or Camphine, is a limpid colourless fluid, of the same odour and taste.

Resin or *Rosin* is a solid semi-transparent yellowish substance with but little odour and taste.

Prop. & Comp. Common Turpentine consists of a mixture of the resin dissolved in the volatile oil, separable by distillation.

The *Oil of Turpentine* ($C_{20}H_{16}$), sp. gr. 0·872, inflammable; mixing with other oils fixed or volatile, soluble in alcohol and ether, and dissolving many bodies, as fats, resins, &c; partly resinifies, partly volatilises, on exposure; forms an artificial camphor ($C_{20}H_{16}$ H Cl.) with hydrochloric acid gas.

The *Resin* ($C_{40}H_{30}O_4$) consists of three isomeric acids, Pimaric, Pinic, and Sylvic, differing in solubility in alcohol. By heat *Colophonic* acid is formed.

Off. Prep. Common Turpentine is contained in Ung. Elemi, and Emplast. Galbani.

Of *Oil of Turpentine.* Enema Terebinthinæ, Lond. Turpentine Enema. (Oil of turpentine, f. ℥j; the yolk of one egg; decoction of barley, f. ℥xix. Rub the oil with the yolk of egg, and add the decoction.)

Linimentum Terebinthinæ, Lond. Liniment of Turpentine. (Soft soap, ℥ij; camphor, ℥j; oil of turpentine, f. ℥xvj. Shake together until they are mixed.)

Of the *Resin.* Ceratum Resinæ, Lond. Resin Cerate. (Resin, wax, of each, ℥xv; olive oil, Oj. Melt the resin and wax together over a slow fire, then add the oil, and press the cerate while hot through linen.)

Emplastrum Resinæ, Lond. Resin Plaster. (Resin, ℔ß;

plaster of lead, ℔iij. Add the resin, first melted, to the plaster liquefied over a slow fire, and mix.) It is also contained in many other plasters and ointments.

Therapeutics. In small doses, oil of turpentine becomes absorbed, and acts as a stimulant, anti-spasmodic, and astringent; its effects are especially directed to the kidneys, causing diuresis, with a peculiar violet odour of the urine, from the oil passing through in an altered condition; it also influences the mucous membrane of the genito-urinary organs in a manner similar to copaiba, and in large doses produces strangury; its astringent property upon the capillary vessels is seen in its power of arresting hæmorrhage, and controlling some forms of inflammation. In large doses, turpentine acts as a purgative, and possesses besides great power in destroying entozoa in the alimentary canal; its purgative operation is often accompanied by nausea and vomiting, and a species of intoxication. Oil of turpentine, when externally applied, produces powerful rubefacient effects, and when the vapour is confined, even vesication: administered as an enema, both the purgative and stimulant effects may result. Oil of turpentine is given occasionally as an antispasmodic in hysterical affections, but, for the most part, as an enema; it is also used in passive forms of intestinal and urinary hæmorrhage, in purpura, and in some forms of iritis: its most frequent internal use is, however, as an anthelmintic, in cases where tænia or tape-worms and other entozoa are present in the intestines. Externally it is used in the form of liniment over chronically inflamed and painful parts, and sprinkled on hot flannel as a fomentation in tympanitic conditions of the abdomen from peritoneal inflammation.

Common Turpentine and *Resin* are used only as external stimulant applications: the latter in the form of cerate or plaster; the former in combination with other resins, as elemi, galbanum, &c.

Dose. Of oil of turpentine, as a stimulant, antispasmodic, or diuretic, ♏x to ♏xxx; as an anthelmintic purgative, f. ʒij to f. ʒvj.

Thus *Lond.* Frankincense. The Turpentine exuding from the bark (hardened in the air) of Pinus excelsa, and Pinus palustris.

Pix Burgundica *Lond.* An impure resin prepared from the turpentine of Abies excelsa.

Description. *True Frankincense* does not come from Pinus palustris, although this tree affords a concrete turpentine, sold for the genuine resin. Frankincense occurs in semi-transparent yellowish brittle tears, having a peculiar, pleasant, but slight terebinthinate odour; it comes chiefly from Germany; the so-called Thus, from Pinus palustris, smells strongly of turpentine. *Burgundy Pitch* is from the same tree as true frankincense, but it flows from incisions in the bark, and is afterwards melted and strained; it comes from Neufchatel, and has the appearance of melted resin.

Prop. & Comp. Chemically these resins are not known to differ from common resin; they may, however, contain more or less volatile oil—Frankincense more than Burgundy Pitch.

Off. Prep. Of *Thus.* THUS PRÆPARATUM, *Lond.* Prepared Frankincense. (Frankincense, ℔j; water, as much as necessary to cover the frankincense. Boil the frankincense in the water until it melts, and strain through a hair-sieve; when cold, pour the water off, and keep the frankincense for use.)

Frankincense is contained also in Emplast. Ferri, Emplast. Galbani, Emplast. Opii, Emplast. Picis, Emplast. Potassii Iodidi.

Of *Pix Burgundica.* PIX BURGUNDICA PRÆPARATA, LOND. Prepared Burgundy Pitch. (Prepare this in the same way as directed for Ammoniacum Præparatum.)

EMPLASTRUM PICIS COMPOSITUM, LOND. Compound Pitch Plaster. (Prepared Burgundy pitch, ℔ij; prepared frankincense, ℔j; resin, wax, each ℥iv; expressed oil of nutmeg, ℥j; olive oil, water, of each, f.℥ij. Add the oils and water to the frankincense, pitch, resin, and wax, previously melted together; then evaporate to a proper consistence, stirring constantly.)

Burgundy pitch is contained also in Emplast. Cumini.

Therapeutics. These substances are only used as slight external stimulants.

Adulteration. A fictitious Burgundy pitch is often sold, made of common resin, coloured, and made opaque with yellow ochre, palm oil, water, &c.

Pix Liquida *Lond.* Tar. A liquid bitumen prepared by heat from the wood of Pinus sylvestris and other species.

Pix *Lond.* Pitch. A dry bitumen, prepared from Tar.

Description. *Tar* is a reddish-black, treacle-like liquid, of peculiar odour; it is made by the slow combustion of the wood with deficient supply of air.

Pitch is black, opaque, solid, hard, breaking with a shining fracture; made by distilling tar, and removing the volatile portion.

Prop. & Comp. *Tar* is very complex in composition; it contains altered resin, or *colophonic* acid, and empyreumatic oil, in which numerous substances, such as *creosote, paraffine, eupione,* &c., have been discovered. When shaken with water, tar-water is produced.

Pitch is the altered resin. The composition of these bodies is as yet by no means well made out.

Off. Prep. Of *Pix Liquida,* or *Tar.* UNGUENTUM PICIS LIQUIDA, LOND. (Liquid pitch, suet, each ℔j. Melt together, and press through a linen cloth.)

Of *Pix* or *Pitch.* UNGUENTUM PICIS, LOND. (Pitch, wax, resin, each ℥xj; olive oil, Oj. Melt together, and pass through a linen cloth.)

Therapeutics. Pitch and Tar are slight external stimulants, useful in certain chronic skin diseases, as lepra and psoriasis and ichthyosis. The vapour of tar has been found useful in chronic bronchitis, and it has been given internally in the above-mentioned skin diseases, and in phthisis, &c.

Dose. Of tar ♏xx to ʒj, and upwards, made into pills with flour, or as tar-water.

Juniperus *Lond.* The fruit of Juniperus communis, or common Juniper; Lin. Syst., Diœcia Monadelphia; growing in Northern Europe, &c.

Juniperi Oleum (Anglicum), *Lond.* The oil distilled from the fruit (English).

Description. The fruit or berries are about the size of black currants, of a dark purple colour, with a bloom upon the surface, filled with a brownish-yellow pulp; their odour agreeable, but slightly terebinthinate.

The Oil of Juniper is pale yellow, having in a high degree the odour and taste of the fruit.

Prop. & Comp. The fruit contains *volatile oil,* Juniperi oleum ($C_{15}H_{12}$, or $3\,C_5H_4$), sp. gr. 0·855; some *resin* from oxidation of the oil, which quickly becomes altered; sugar, wax, &c.

Off. Prep. Of the oil, SPIRITUS JUNIPERI COMPOSITUS, LOND. (Oil of juniper, f.ʒjß; oil of carraway, oil of fennel, each ♏xij; proof spirit, a gallon. Dissolve.)

INFUSUM JUNIPERI, DUB. (Made by infusing ℥j of the juniper fruit in Oj of boiling water for an hour, in a covered vessel, and straining.)

The fruit is used in making Decoct. Scoparii Comp.

Therapeutics. The fruit and oil are stimulant and diuretic; used in medicine chiefly for the latter property; useful in different forms of dropsies, either alone, or combined with other diuretics. It is contained in Hollands.

Dose. Of spiritus juniperi comp., f.ʒj to f.℥ß; of the oil, ♏iij to ♏x; of infus. juniperi, *Dub.*, f.℥j to f.℥iv.

Sabina *Lond.* Savine. The recent and dried tops of Juniperus Sabina; Lin. Syst., Diœcia Monadelphia; growing in the South of Europe, and temperate parts of Asia.

Sabinæ Oleum *Lond.* Oil of Savine. Distilled from the tops.

Description. The *fresh tops* consist of the young branches enveloped in imbricated leaves of a dark green colour; strong disagreeable odour and taste. The tops can be detected when in coarse powder, by means of the microscope, as the woody fibres exhibit the circular pores which characterise the gymnosperms.

The *Oil* is of a light yellow colour, with the odour and taste of the tops.

Prop. & Comp. The tops owe their activity to the *volatile oil*, oleum sabinæ ($C_{10}H_8$), sp. gr. 0·915; besides which, a *resin*, gallic acid, and the ordinary ingredients of young tops are present.

Off. Prep. UNGUENTUM SABINÆ, LOND. Savine Ointment. (Fresh savine, bruised, ℔ß; white wax ℥iij; lard ℔j. Mix the savine with the lard and wax melted together, then press through a linen cloth.)

Therapeutics. Savine acts as an irritant both internally and externally; it also appears to possess much power as an emmenagogue. It is used externally to keep up the discharge from blistered surfaces; internally in deficient menstruation, unattended with congestion of the pelvic organs. In large doses it causes abortion, and its administration is attended with much danger in pregnancy.

Dose. Of dried leaves, gr. v, upwards; of oleum sabinæ, ♏ij to ♏iv (suspended); of an infusion of the fresh tops (ʒj of tops to f.℥viij of water) f.℥ß to f.ʒj or more.

In the Edinburgh Pharmacopœia there are two other turpentines made officinal: BALSAMUM CANADENSE, Canada Balsam, a semi-fluid resin from the Abies balsamea; of a very light yellow colour, and agreeable odour, having the same composition and medicinal virtues as common turpentine; much used for mounting objects for the microscope; and—

TEREBENTHINA VENETA, Venice Turpentine, the liquid resinous exudation of Abies larix (often much adulterated, or other turpentines substituted for it); having the same composition and medicinal properties as the last.

CLASS II. ENDOGENÆ.

ZINGIBERACEÆ.

Zingiber *Lond.* The rhizome of the Zingiber officinalis, Ginger; Lin. Syst., Monandria Monogynia; native of Hindostan, but is cultivated in the West Indies as well as in the East.

Description. The recent root is generally about 3 inches in length, knotty, externally of a light ash colour, internally yellowish. There are two principal varieties, the white or Jamaica, and the black or East Indian; for the former the best pieces are selected, scraped, scalded, and dried by exposure to the sun; the black variety is dried without being first scraped, hence it is the larger of the two.

Prop. & Comp. Odour spicy and aromatic; taste warm and pungent. In addition to the ordinary constituents of roots, it contains a *volatile oil* and a *resinous matter,* upon which its pungency seems to depend. The sp. gr. of the oil is 0·896, and its composition may be represented by the formula 2 $(C_4 H_5)$. The quantity of starch contained in the root is considerable.

Off. Prep. TINCTURA ZINGIBERIS, LOND. Tincture of Ginger. (Ginger, bruised, ℥ijſs; rectified spirit, Oij. Macerate for seven days, then press and strain.)

SYRUPUS ZINGIBERIS, LOND. Syrup of Ginger. (Ginger, sliced, ℥ijſs; boiling distilled water, Oj; sugar, ℔ijſs, or as much as may be necessary; rectified spirit, as much as may be required. Macerate the ginger in the water for four hours; press out the liquor and strain: then complete the process as directed for Syrup of Marshmallow.)

Ginger also enters as an ingredient into many officinal preparations.

Therapeutics. Ginger is an aromatic stimulant and car-

minative. When taken internally it produces an agreeable feeling of warmth at the epigastrium, and appears to aid digestion by giving a healthy tone to the stomach; hence it is used in atonic forms of dyspepsia, especially if attended with much flatulence, and as an adjunct to various purgative medicines to correct their griping tendency. When chewed it acts as a sialagogue, and is sometimes used in relaxed states of the uvula and tonsils.

Dose. In powder, grs. x to ℈j and upwards; of tincture, f. ʒiß to f. ʒij. A much stronger tincture, known as the Essence of Ginger, is frequently made use of, which on the addition of water becomes turbid from the precipitation of the resinous matters: the Dublin tincture has three times the strength of that of the London College.

Curcuma *Lond. Appendix.* Turmeric, the rhizome of Curcuma longa; Lin. Syst., Monandria Monogynia; native of Ceylon.

Description. The best rhizomes are in small short pieces, yellow externally, deep orange within.

Prop. & Comp. Turmeric contains a peculiar colouring principle soluble in alcohol, and when dried, of bright yellow colour; by the action of alkalies this is turned to a deep brown.

Use. Turmeric acts as a stimulant, but is not used as a remedy: it is taken as a condiment in the form of curry powder, of which it is an ingredient. In the London Appendix it is introduced for testing alkalies. It is generally prepared for this purpose by brushing the tincture or decoction on unsized paper and allowing it to dry; the yellow paper when dipped into a fluid having an alkaline reaction becomes dark brown. Hence its value as a test.

Cardamomum *Lond.* The seed of Elettaria (Alpinia Roxb.) Cardamomum, Cardamoms; Lin. Syst., Monandria Monogynia; native of Malabar.

Description. The seeds are generally met with in their capsules; the capsules are oblong triangular, the angles being somewhat rounded off, wrinkled, and of a light yellow colour, divided into three compartments, each of which contains numerous seeds of a dark colour, and triangular in shape. Cardamoms are distinguished according to their lengths by the respective names of shorts, short-longs, and longs.

Prop. & Comp. The seeds have a fragrant odour, which depends on the presence of a *volatile oil;* the amount yielded being about 4·5 per cent. This is of an aromatic taste, and is said to have a sp. gr. of 0·945; they contain in addition a fixed oil, together with *colouring matter* and salts, &c.

Off. Prep. Tinctura Cardamomi Composita, Lond. Compound Tincture of Cardamoms. (Cardamoms bruised, cochineal bruised, carraway bruised, each ʒijß; cinnamon bruised, ʒv; raisins stoned ℥v; proof spirit, Oij. Macerate for seven days, then press and strain.)

Cardamom is also an ingredient of some other preparations, as Confectio aromatica.

Therapeutics. It is an agreeable aromatic stimulant stomachic, and carminative; used in the East as a condiment. Chiefly employed as an adjunct to purgative and other medicines, to correct any tendency to griping, also as a colouring matter.

Dose. Of the tincture, f. ʒß to ʒij.

MARANTACEÆ.

Maranta *Lond.* Fecula of the tuber of Maranta arundinacea (arrow-root); Lin. Syst., Monandria Monogynia; native of the West Indies.

Description. A white powder, tasteless and inodorous.

Prop. & Comp. It consists of pure starch. Under the microscope the form of the granules is ovate, oblong, or irregularly convex, with very fine rings, and a circular hilum, often cracked in a stellate or linear manner; the size varies from the 800th to 2000th of an inch; the greater number are small.

Therapeutics. Demulcent; chiefly employed as an article of diet for invalids.

Dose. Ad libitum.

Adulteration. Potato starch, distinguishable under microscope by having much larger grains than arrow-root, and by the concentive rings being strongly marked.

IRIDACEÆ.

Crocus *Lond.* The stigmata of Crocus sativus. Saffron; Lin. Syst., Triandria Monogynia; native of Greece and Asia

Minor; cultivated in most of the warm countries of Europe for medicinal purposes.

Description. The stigma, and part of the style of the flower, forms a thin filament, broad at one end, and tripartite, of an orange-red colour. Dried carefully, without further preparation, it forms *hay saffron,* but when packed and pressed into parcels, *cake saffron.*

Prop. & Comp. Saffron moistened and pressed upon white paper leaves an orange-coloured stain, and yields to water and alcohol an orange-red *colouring matter.* It also contains a *volatile oil.*

Off. Prep. SYRUPUS CROCI, LOND. Syrup of Saffron. (Saffron, ʒv; boiling distilled water, Oj; sugar, three pounds, or as much as is sufficient; rectified spirit, ℥ijß, or as much as is sufficient. Macerate the saffron in water for twelve hours in a closed vessel, then strain the liquor, and finish as directed for Syrup of Marshmallow.)

Therapeutics. Saffron has a very slight stimulant action; it is rarely given alone, and its chief use in medicinal preparations is as a colouring agent.

Dose. Of dried saffron, from gr. xx upwards; of the syrup, ad libitum.

SMILACEÆ.

Sarsa (Jamaicensis) *Lond.* The root of Smilax officinalis. Sarsaparilla; Lin. Syst., Diœcia Hexandria; grows in South America.

Description. Sarsaparilla consists of the rhizome or root-stock, called also the chump, with numerous roots attached, generally several feet long, but of different lengths and thickness in different varieties; these roots often give off secondary rootlets, which are themselves again finely subdivided; they are then said to be bearded. On a transverse section of the roots they are seen to consist of a cortex or rind, and a ligneous cord, or meditullium inclosing the pith. According to the different characters of these layers they have been classified by Dr. Pereira into the *mealy* and *non-mealy* sarsaparillas.

The *mealy* varieties are distinguished by the large amount of starch contained in the inner cortical layers, which is sometimes equal in thickness to the meditullium; they break with a starchy fracture; the cortex is often cracked transversely, and sometimes falls off; they have sometimes a swollen appearance,

and hence are named gouty. If a drop of sulphuric acid be added to a transverse section, the mealy coat is unchanged, the ligneous zone becomes of a dark purple, and when a solution of iodine is applied the starchy layer becomes evident, from the formation of the blue iodide of amylin.

The mealy varieties include the *Honduras*, the *Brazilian*, and the *Caraccas*, or gouty Vera Cruz.

The *Honduras* occurs in bundles, about three feet long, composed of the folded roots, secured by a few circular twists; of a dirty brown colour, with many lateral fibres, but no chump; it is very mealy. It is brought from the Bay of Honduras. The botanical origin is doubtful.

The *Brazilian* or *Lisbon* occurs in bundles, from three to five feet long, composed of the unfolded roots, bound together very tightly by a flexible stem; of a reddish-brown colour, with few rootlets. It comes from the Brazils, through Lisbon. It is probably derived from Smilax papyracea, and Smilax officinalis.

Caraccas, or *Gouty Vera Cruz*. In bundles, two and a half feet long, and one foot broad, of a pale yellow colour. The chump is present, and it is very mealy. Derived from Smilax officinalis and Syphilitica.

In the *non-mealy* varieties the cortex is deeply coloured and not mealy. Although some starch granules can be detected under the microscope, still the number is comparatively few. The diameter of the meditullium is generally four or five times greater than that of the cortex. Oil of vitriol applied to a transverse section causes both cortex and wood to become of a dark red tint, and iodine shows but a small amount of starch. Under this division are included the *Jamaica*, the *Lima*, and the *true* or *lean Vera Cruz*.

The *Jamaica* occurs in bundles, from a foot to a foot and a half in length, with spirally twisted roots, folded, and numerous rootlets (*bearded*), of a red colour. It is derived from Smilax officinalis: it comes by way of Jamaica. This is the only officinal variety; it is stated in the Pharmacopœia to be of a reddish colour, not mealy, and with numerous rootlets. It yields much extractive matter.

Lima Sarsaparilla occurs in bundles, about two or three feet long, folded, with the chump in the interior, of greyish-brown colour; it is derived from Smilax officinalis.

The *true Vera Cruz* is not often found in commerce; it is lean, unfolded, with few rootlets; the chump is present.

Prop. & Comp. Sarsaparilla contains a volatile oil, starch, ligneous fibre, and a peculiar principle occurring as a white powder, *Smilacin*, of which little is known; soluble in hot water

and alcohol, but almost insoluble in cold water; it colours sulphuric acid red.

Off. Prep. Decoctum Sarsæ, Lond. Decoction of Sarsaparilla. (Sarsaparilla ℥v; distilled water Oiv. Boil down to two pints, and strain.)

Decoctum Sarsæ Compositum, Lond. Compound Decoction of Sarsaparilla. (Boiling decoction of sarsaparilla, Oiv; sassafras sliced, guaiacum wood rasped, fresh liquorice bruised, each ʒx; mezereon, ʒiij. Boil for fifteen minutes, and strain.)

Extractum Sarsæ Liquidum, Lond. Liquid Extract of Sarsaparilla. (Sarsaparilla ℔iijß; distilled water, five gallons; rectified spirits, f℥ij. Boil the sarsaparilla in three gallons of water to twelve pints, pour off the liquor, and strain while hot. Boil the sarsaparilla again in the remaining water down to half, and strain. Evaporate the mixed liquors to eighteen fluid ounces, and when the extract has cooled, add the spirit.)

Syrupus Sarsæ, Lond. Syrup of Sarsaparilla. (Sarsaparilla ℔iijß; distilled water, three gallons; sugar ℥viij; rectified spirit, f.℥ij. Boil the sarsaparilla in two gallons of water down to a gallon, pour off the liquor, and strain while hot. Again boil the sarsaparilla in the remaining water down to half, and strain. Mix the liquors and evaporate to two pints, and in these dissolve the sugar. When they have cooled, add the spirit.)

Therapeutics. Very little that is definite can be stated with regard to the action of sarsaparilla upon the animal economy; it is supposed to be diaphoretic, diuretic, tonic, and alterative. It is extensively employed in the treatment of secondary syphilis, but as it has been generally administered in combination with powerful remedies, it is difficult to ascertain how much influence this drug has had in the cure of the affection. By some practitioners sarsaparilla is regarded as a remedy of great value; by others as possessing but little power: as a rule, it is more relied on by surgeons than physicians. Sarsaparilla has also been given in cachectic conditions of the habit depending upon other causes, as in scrofula, &c.; and in the form of the compound decoction, in which other stimulant sudorific agents are present, in the chronic forms of rheumatism, gout, and skin diseases.

Dose. Of either decoction, f.℥jß to f.℥iv; of the liquid extract, f.ʒj to f. ʒiij; of the syrup, f.℥ß, upwards, usually an adjunct to the other preparations of sarsaparilla.

Adulteration. Inferior kinds of sarsaparilla are substituted for the officinal Jamaica variety; these yield much less extractive matter; sometimes other substances are mixed with it, as dulcamara, &c., detected by the difference of structure.

PALMÆ.

Sago *Lond.* The fecula of the stem of Sagus lævis, and other specis of Palm; Lin. Syst., Monœcia Hexandria; native of the East Indies.

Description. Sago of the shops is of two kinds; the first variety, in very fine grains, is known as pearl sago; in the second, or common sago, the grains are much larger and coarser.

Prop. & Comp. It consists principally of *starch.* Under the microscope the granules are found smaller than those of potato starch, the hilum is circular, breaking with a single slit, or in a stellate manner, and the circular rugæ are much less marked.

Off. Prep. None.

Therapeutics. It is easily digested, and nutritive; chiefly used as an amylaceous diet for convalescents.

LILIACEÆ.

Scilla *Lond.* The recent bulb of Urginea Scilla (Scilla maritima); Squill; Lin. Syst., Hexandria Monogynia; growing on the southern coasts of Europe bordering on the Mediterranean.

Description. The recent bulb is pear-shaped, varying in size from a man's fist upwards. It is made of a series of scales, overlapping one another; the outer ones are thin and membranous, and more or less yellow; the internal thicker, fleshy, and white. As met with in the shops, it is generally in small, thin, transparent pieces, of a white or slight yellow colour, consisting of transverse sections of the bulb.

Prop. & Comp. The bulb is dried in the same manner as that of colchicum. It is devoid of odour, with an acrid, disagreeable taste. It yields its active constituents to water, acetic acid, and alcohol. From the most recent analysis, it appears to contain an *acrid resin,* having very powerful medicinal properties; also a very *bitter principle, Scillitine,* together with sugar, mucilage, and citrate of lime, which is found in the form of acicular crystals in the parenchyma of the bulb.

Off. Prep. ACETUM SCILLÆ, LOND. Vinegar of Squill. (Squill, recently dried and bruised, ℥ijß; dilute acetic acid, Oj; proof spirit, ℥jß. Macerate the squill with the acid, with a gentle heat, in a closed vessel for three days; then press out the liquor,

and set aside, that the dregs may subside; lastly, add the spirit to the strained liquor.)

OXYMEL SCILLÆ, LOND. Oxymel of Squills. (Vinegar of squills, Oijß; honey, ℔v. Evaporate the vinegar over a slow fire down to twelve fluid ounces, and mix with the honey made hot.)

PILULA SCILLÆ COMPOSITA, LOND. Compound Pill of Squill. (Freshly powdered squill, ℨj; ginger powdered, ammoniacum powdered, each ℨij; soft soap ℨiij; treacle ℨj. Mix the powders together, then add the remaining ingredients; beat all together to form a mass.)

PILULA IPECACUANHÆ CUM SCILLÂ, LOND. Pill of Ipecacuanha with Squill. (Compound powder of ipecacuanha, ℨiij; squill freshly powdered, ammoniacum powdered, each ℨj; treacle, as much as may be necessary. Beat all together, that a mass may be formed.)

TINCTURA SCILLÆ, LOND. Tincture of Squill. (Squill recently dried, ℥v; proof spirit, Oij. Macerate for seven days; then press and strain.)

Therapeutics. Squill acts as a stimulant expectorant and diuretic, and in larger doses produces vomiting and purging. It increases the secretion of the bronchial mucous membrane, and also aids the expectoration of mucus, when abundant and viscid. Its stimulating and acrid properties render it inadmissible in cases of an active inflammatory nature. As a diuretic, it is generally given in combination with a mercurial. It is seldom given as an emetic, as it produces distressing nausea, and sometimes hypercatharsis. As an expectorant, ipecacuanha and ammoniacum are frequently conjoined with it.

Dose. Of acetum scillæ, f.ℨß to f.ℨjß; of oxymel scillæ, f.ℨj to f.ℨij; of pilula scillæ comp., gr. v to gr. x; of pil. ipecacuanhæ cum scillâ, gr. v to gr. x; of tinctura scillæ, ♏x to ♏xx.

Aloe Barbadensis *Lond.* Barbadoes Aloes. Inspissated juice of the cut leaf of Aloe vulgaris, the common Aloe, growing in the East and West Indies.

Aloe Hepatica *Lond.* Hepatic or Liver Aloes, the inspissated juice of the leaf of uncertain species of aloes.

Aloe Socotrina *Lond.* Socotrine Aloes. The juice of the cut leaf of uncertain species of aloes, hardened in the air.

Description. Barbadoes aloes is usually seen in the gourds in which it is collected and dried; it has a dull appearance, of a brownish-black colour, very opaque, even in thin layers, with

an odour which is extremely nauseous, especially when breathed upon; the taste is intensely bitter; when powdered, it has a dull olive-green colour, and the best kinds, examined microscopically, are found to be studded with crystals; it is the produce of *Aloe vulgaris*, and probably of other species also.

Hepatic Aloes, called also *East Indian Aloes*, has a dark reddish-brown or liver colour; opaque or translucent; usually more or less brittle; possesses an odour not disagreeable; taste very bitter; the colour of the powder is yellow; microscopically examined, numerous small crystals are usually observed.

Socotrine Aloes has a bright garnet-red colour; breaks with a vitreous fracture, and possesses considerable transparency; the odour is fruity, and by no means disagreeable, the taste very bitter; the colour of the powder is bright orange-yellow, and, microscopically examined, gives no appearance of crystalline structure; occasionally a vein, having the appearance of this kind of aloes, is found in the casks of the Hepatic variety.

Within the last few years, a large sample of liquid aloes has been imported from the coasts of the Red Sea, stated to be the produce of the plant yielding true *Socotrine* aloes; this liquid, which has the consistence of treacle, is at first nearly opaque, but gives rise to a deposit; the upper portion then becomes transparent, and the opaque sediment, under the microscope, is found to consist of myriads of prismatic crystals. When liquid aloes is dried at a very low temperature, as in the sun, an opaque mass, crystalline in structure, and not unlike Hepatic aloes, is produced; when, however, heat is employed, the crystals are dissolved, and a transparent variety, similar to Socotrine aloes, results. Hepatic and Barbadoes aloes will also, if heated in thin layers, lose their crystalline structure, and become transparent. From these facts it would seem probable that the best Barbadoes and Hepatic aloes are dried at a low temperature, but that artificial heat is employed in preparing the Socotrine.

A fourth variety, called *Cape Aloes*, the produce of Aloe spicata and other species, is often met with in masses which break with a conchoidal fracture, of a greenish-brownish colour, and having some translucency; the powder of a greenish-yellow tint, and does not exhibit any crystalline appearance under the microscope; the odour is often strong, but not nauseous like Barbadoes aloes.

An inferior kind of Cape Aloes has been named Caballine Aloes.

Prop. & Comp. A principle named *Aloine* has been obtained from nearly all the varieties of aloes, which crystallises in needles and has the formula ($C_{34}\ H_{18}\ O_{14}+HO$); it is probably the same as the crystalline matter contained in the semi-fluid

form of aloes, and in the Barbadoes and Hepatic varieties; in addition to this principle aloes contains a substance which has been named *resin*, differing however from ordinary resins in being soluble in boiling water; it is probably formed from aloine by the action of the air; when aloes are acted upon by nitric acid, several crystalline compounds are obtained, as *Polychromic*, *Chrysammic* and *Chrysolepic* acids, whose solutions are strongly red and purple coloured. A peculiar acid, named *Aloetic acid*, is also found in aloes, which strikes olive-brown with the persalts of iron.

Off. Prep. Decoctum Aloes Compositum, Lond. Compound Decoction of Aloes. (Extract of liquorice ʒvij; carbonate of potash ʒj; extract of aloes, powdered myrrh, saffron, each ʒjß; distilled water Ojß; compound tincture of cardamoms f. ℥vij. Boil down the liquorice, carbonate of potash, aloes, myrrh, and saffron with the water to a pint, and strain, then add the tincture.)

Enema Aloes, Lond. Enema of Aloes. (Aloes ℈ij; carbonate of potash, gr. xv; decoction of barley Oß. Mix, and rub them together.)

Extractum Aloes, Lond. Extract of Aloes. (Socotrine aloes ℥xv; boiling distilled water, a gallon. Macerate with a gentle heat for three days, afterwards strain and set aside that the dregs may subside. Pour off the clear liquor, and evaporate to proper consistence.)

Extractum Aloes Barbadensis, Lond. Extract of Barbadoes Aloes. (Prepare this in the same manner as directed for Extract of Aloes.)

Pilula Aloes Composita, Lond. Compound Aloes Pill. (Socotrine aloes, powdered, ℥j; extract of gentian, ℥ß; oil of carraway, ♏xl; treacle, as much as may be necessary. Beat them together into a proper pill mass.)

Pilula Aloes cum Myrrhâ, Lond. Pill of Aloes with Myrrh. (Socotrine or hepatic aloes, powdered, ℥ß; saffron, myrrh powdered, soft soap, each ʒij; treacle, as much as may be necessary. Beat them together to form a mass.)

Pilula Aloes cum Sapone, Lond. Pill of Aloes with Soap. (Extract of Barbadoes aloes powdered, soft soap, extract of liquorice, equal parts; treacle, as much as may be necessary. Beat the extract of aloes with the soap; then add the remaining ingredients; beat all together to form a mass.)

Pulvis Aloes Compositus, Lond. Compound Aloes Powder. (Socotrine or hepatic aloes ℥jß; guaiacum ℥j; compound powdered cinnamon ℥ß. Rub the aloes and guaiacum separately to powder, then mix them with the compound powder of cinnamon.)

Tinctura Aloes, Lond. Tincture of Aloes. (Socotrine or hepatic aloes, coarsely powdered, ℥j; extract of liquorice ℥iij; distilled water, Ojß; rectified spirit, Oß. Macerate the aloes in the spirit mixed with the water for seven days; afterwards add the extract, that it may be dissolved, and strain.)

Tinctura Aloes Composita, Lond. Compound Tincture of Aloes. (Socotrine or hepatic aloes, coarsely powdered, ℥iv; saffron ℥ij; tincture of myrrh Oij. Macerate for seven days, and strain.)

Vinum Aloes, Lond. Wine of Aloes. (Socotrine or hepatic aloes, reduced to powder, ℥ij; canella, powdered, ʒiv; sherry wine, Oij. Macerate for seven days, and strain.)

Aloes is also contained in other officinal preparations, as Tinct. Benzoini C.; Pil. Coloc. C.; Pil. Cambogiæ C.; and Pil. Rhei C.

Therapeutics. Aloes, when taken internally, acts as a purgative, affecting chiefly the lower portion of the intestinal canal, sometimes causing hæmorrhoids. The secretions of the tube are but little augmented, and the action is slow in character; by some observers it is asserted that the bile is increased in quantity, and the drug appears to influence the whole portal circulation. Emmenagogue effects also are frequently produced. Upon the upper part of the canal, tonic and stomachic effects seem to be induced when small doses are administered.

Aloetic preparations are given in cases of habitual constipation, and are of great value from the little disposition they possess of inducing a subsequent confined state of bowels.

In chronic dyspepsia they frequently form a portion of the habitual pill, and may be combined with tonics and stomachics. They are often used as adjuncts to other purgatives, as colocynth, rhubarb, scammony, &c., when full cathartic effects are desired, and when there is a defective secretion of bile.

Combined with iron and myrrh, aloes are frequently given in amenorrhœa, connected with defective action of the pelvic organs, and an anæmic condition of the blood.

Aloes should be avoided in cases where there is much tendency to hæmorrhoids, or when inflammatory action is present in the abdominal organs.

There appears to be but little difference of action between the officinal species of aloes. Cape aloes, however, which is not unfrequently employed, is less active than the others.

Dose. Of aloes, gr. iij to gr. xij; of the extracts of aloes, gr. iij to gr. xij; of the compound powders of aloes, gr. v to ℈j; of the

different aloetic pills, gr. v to ℈j; of the simple tincture of aloes, f. ʒij to f. ℥ß; of the compound tincture of aloes, f. ʒß to f. ʒj; of the wine of aloes, f. ʒj to f. ʒij; of the compound decoction of aloes, f. ℥j to f. ℥ij.

Small doses may be given as adjuncts to other purgatives, or when the drug is given frequently in combination with stomachics and purgatives. The watery extract is considered a milder preparation than simple aloes.

MELANTHACEÆ.

Veratrum *Lond.* The rhizome of Veratrum album, White Hellebore; Lin. Syst., Polygamia Monœcia; growing in the Pyrenees and Alps.

Description. The rhizome is met with in conical truncated pieces, about two or three inches long, and about one inch in diameter, with numerous radicles proceeding from it; yellowish-brown and wrinkled on the outside, light-coloured within, with little odour when dry, but an acrid bitter taste.

Prop. & Comp. The composition of veratrum has not been well established; it appears to contain an alkaloid, *veratria* (C_{34} H_{22} N O_6), united with an acid formerly considered to be gallic acid, probably *veratric*, the same which exists in the seeds of Asagræa officinalis; formula (C_{18} H_9 O_7+HO); a principle named *Jervine* has also been said to exist in it, of which little is as yet known; the other constituents of the rhizome are lignin, starch, and fatty matter.

Off. Prep. Vinum Veratri, Lond. Wine of White Hellebore. (White hellebore, sliced, ℥viii; sherry wine, Oij. Macerate for seven days, and strain.)

Veratrum is also contained in Unguentum Sulphuris Compositum.

Therapeutics. Veratrum acts as a powerful emetic and drastic purgative, causing much thirst and irritation of the alimentary canal; when applied to the mucous membranes of the nose, intense sneezing results; and on the skin it also acts as a topical irritant. It is not much employed as a remedy at the present time, but was formerly given in cerebral affections, as mania, epilepsy, &c. It has been proposed as a remedy in gout, in lieu of colchicum, but from the author's experience of its effects, he is sure that its action differs completely from that of the latter drug; it appeared to produce a burning sensation of the œso-

phagus, parched mouth, and intense thirst, accompanied by great depression, without any alleviation of the gouty symptoms. Externally veratrum is used in scabies, and occasionally in obstinate skin affections, in the form of the Compound Sulphur Ointment.

Dose. Of vinum veratri ℳx to ℳxx.

Veratria *Lond.* An alkaloid prepared from the seeds of Asagræa officinalis, or Cevadilla Seeds; Lin. Syst., Hexandria Trigynia; growing on the Andes in Mexico.

Description. Veratria occurs in the form of a white or dirty-white powder.

Prop. & Comp. The following characters of the alkaloid are given by the London College: "It is very slightly soluble in water, more soluble in ether, but especially so in rectified spirit. It has no odour, but irritates the nostrils very much; it has an acrid taste." Veratria is not crystalline, but it forms with several of the acids salts which apparently are so. It causes violent sneezing when applied to the nostrils. Veratria has the formula ($C_{34}\ H_{22}\ NO_6$); one pound of the seeds is said to yield one drachm of the alkaloid. Brought into contact with strong sulphuric acid it assumes an intense red colour, and with nitric acid a yellow solution; it is fusible. The veratria of commerce is said to contain another principle, *sabadillina,* which is crystalline, insoluble in ether, by which it may be separated from veratria; it does not excite sneezing.

Therapeutics. As veratrum, but much more powerful; sometimes it is used as a topical irritant in lieu of aconite; it has less benumbing effect.

Dose. Gr. $\frac{1}{12}$ to gr. $\frac{1}{6}$. The London College directs that it should be exhibited with great care.

Colchici Cormus *Lond.* The recent and dried Corm of the wild herb Colchicum autumnale; Lin. Syst., Hexandria Trigynia; indigenous.

Colchici Semen *Lond.* The Seeds. The London College directs that the corm should be dug up in the month of July, or before the autumnal bud is developed; and for the drying, it directs that the dry tunics being first removed, the corm should be cut transversely into thin slices, and dried at first with a gentle heat, gradually increasing to a temperature of 150° Fah.

Description. The *corm* is about the size of a chestnut, and of a somewhat similar shape, being convex on one side, and flattened or slightly concave on the other. When recent, it is solid and fleshy with an external brown membranous coat, internally white, and yielding a milky juice on section. There is often a small lateral projection from its base. When dried and deprived of its outer coat, it is of an ash-gray colour; it is generally met with in transverse slices forming a somewhat oval plane; one border convex, the other concave or slightly hollowed out. The taste is bitter and acrid. The *seeds* are spherical, externally of a reddish-brown colour, white within, rather more than a line in diameter.

Prop. & Comp. The corm, and also the seeds, contain fatty matters, gum, starch, lignin, with a peculiar acid—the *Cevadic* acid—and a crystalline alkaloid, *Colchicia,* more soluble in water than veratria, soluble also in alcohol; it has very seldom been isolated.

Off. Prep. (*Of the Corm.*) Extractum Colchici, Lond. Extract of Colchicum. (Fresh colchicum corms, ℔j. Take away the outer coat of the corms, and complete the process as directed for Extract of Aconite.)

Extractum Colchici Aceticum, Lond. Acetic Extract of Colchicum. (Fresh colchicum corms, ℔j; acetic acid, f.℥iij. Bruise the corms, the outer coating being removed, gradually sprinkle them with acetic acid; then press out the juice, and, unstrained, evaporate to a proper consistence.)

Acetum Colchici, Lond. Vinegar of Colchicum. (Dried colchicum corms ℥iijß; dilute acetic acid, Oj; proof spirit ℥jß. Macerate the colchicum with the acid in a closed vessel for three days, then press out the liquor, and set aside, that the dregs may subside; lastly, add the spirit to the strained liquor.)

Vinum Colchici, Lond. Wine of Colchicum. (Dried colchicum corms ℥viij; sherry wine, Oij. Macerate for seven days, and strain.)

(*Of the Seeds.*) Tinctura Colchici, Lond. Tincture of Colchicum. (Colchicum seeds, bruised, ℥v; proof spirit, Oij. Macerate for seven days, then press and strain.)

Tinctura Colchici Composita, Lond. Compound Tincture of Colchicum. (Colchicum seeds, bruised, ℥v; aromatic spirit of ammonia, Oij. Macerate for seven days, then press and strain.)

Therapeutics. Colchicum in medicinal doses produces increased action of some of the secreting organs, the bile appears to be thrown out in larger quantities, and the fæces become more coloured, and often give evidence of containing the real organic portion of that fluid as well as the colouring matter;

sometimes the urine is increased in quantity, and it is generally asserted that the urea and uric acid are also augmented, but from rather numerous trials the author is inclined to question the accuracy of the last assertion; at times, also, the action of the skin is increased; the heart's action is diminished, and in some patients, intermission of the pulse is produced by the drug; in larger doses, vomiting and purging, accompanied by intense prostration, ensue. When colchicum is administered to patients suffering from gouty inflammation and pain, these symptoms are usually greatly relieved, and to such an extent, that the drug is regarded as almost a specific in this form of disease. Colchicum is employed very extensively in the different forms of gout; sometimes given in small doses short of inducing purging, at other times to act freely on the bowels; it certainly possesses a power of controlling the pain and inflammation in gout, independent of all evident increase of the secretions; in what way this effect is produced is at present unknown. In acute rheumatism and other inflammatory affections, colchicum often relieves, probably rather by its controlling power over the heart's action, than by any specific effect of the medicine. Colchicum may also be very advantageously given, in cases of imperfect action of the liver, as a cholagogue, combined with other purgatives; and it may be often substituted for mercurials. It has occasionally been prescribed in dropsies and skin affections. Some practitioners prefer the seeds, some the corm, some again the flowers; it appears however most probable, that the same principle gives activity to all parts of the plant, and that any difference is in degree rather than in character.

Dose. Of pulv. cormi colchici, gr. ij to gr. viij; of acetum colchici, f.ʒj to f.ʒiij; of extractum colchici, gr. $\frac{1}{2}$ to gr. ij; of extractum colchici aceticum, gr. $\frac{1}{2}$ to gr. ij; of tinctura colchici, ♏xv to f.ʒj; of tinctura colchici comp. ♏xv to f.ʒj; of vinum colchici, ♏xv to f.ʒj.

GRAMINACEÆ.

Farina *Lond.* The flour of the seed of Triticum vulgare. Wheat Flour; Lin. Syst., Triandria Digynia; growing in Europe, and cultivated also over the greater part of the civilised world.

Panis (Triticea) *Lond.* Wheaten Bread.

Amylum *Lond.* Starch, the fecula of the seed.

Description. These substances are too well known to need description.

Prop. & Comp. Flour consists chiefly of *starch* and *gluten*, together with gum, sugar, mucilage, and water. If kneaded under a stream of water, the starch is washed away, and a tenacious mass left behind, which consists of gluten, constituting from 10 to 12 per cent. of the flour. *Gluten* prepared in the above manner consists of two different substances, one of which is soluble in alcohol, pure gluten, or vegetable fibrine, the other insoluble in that menstruum known as vegetable albumen. *Starch* occurs as a white granular powder, without odour or taste. Under the microscope it is found to consist of grains, the size of which varies, having more or less of a circular outline and flattened, the hilum in the centre is surrounded by a series of concentric rings reaching sometimes nearly to the circumference. Each grain consists of a thin external coat, of albuminous structure, the internal contents consist of amidin, the formula of which is ($C_{12}\ H_{10}\ O_{10}$). This substance is the same from whatever source derived, and it is to the different forms of the external coat that the peculiarities of the different granules of starch, when derived from different sources, are due. Amidin is soluble in hot water, but starch requires boiling for some little time, in order that the contents of the granules may swell and burst the envelope, before a solution can be made. Amidin strikes a fine blue colour on the addition of free iodine, forming a compound (Iodide of Amidin), which is a ready means of detecting its presence. This blue colour is destroyed by a heat of 200° Fah., but returns when the solution cools. By heating for some time with dilute sulphuric acid, starch is converted into *dextrine*, and ultimately into *glucose* or grape sugar. Strong nitric acid changes it into oxalic acid.

Off. Prep. (*Of Amylum.*) Decoctum Amyli, Lond. Decoction of Starch. (Starch, ℥iv; water, one pint. Rub together the starch, gradually pouring on the water, then boil.)

Therapeutics. Made into bread *flour* forms a well-known nutritive article of diet. In medicine it is chiefly used in the form of bread crumbs (mica panis), for giving consistence to pills; it is also employed as an emollient cataplasm. Flour is also used as an ingredient of Cataplasma Fermenti. *Starch* is a mild nutriment and demulcent; in the form of decoction it is used as a vehicle for enemata.

Hordeum *Lond.* Barley, the decorticated seeds of Hordeum

distichon; Lin. Syst., Triandria Digynia; cultivated in Europe generally.

Description. Chiefly seen in the shops in the form of pearl barley. This consists of the seeds decorticated and rounded in a mill.

Prop. & Comp. It contains *gluten, starch,* gum, and saccharine matters.

Off. Prep. Decoctum Hordei, Lond. Decoction of Barley. (Barley ℥ijß; distilled water Oivß. First wash the barley, that nothing may adhere to it, then pour on half a pint of water and boil for a little while; throw this water away, pour what remains upon it, first heated, then boil down to two pints and strain.)

Decoctum Hordei Compositum, Lond. Compound Decoction of Barley. (Decoction of barley, Oij; figs, sliced, ℥ijß; fresh liquorice, sliced, ʒv; stoned raisins, ℥ijß; distilled water, Oj. Boil down to two pints, and strain.)

Therapeutics. Used in medicine in the form of decoction as a mild nutritive and demulcent drink.

Dose. Ad libitum.

Avena *Lond.* The decorticated seeds of Avena sativa (the Common Oat); Lin. Syst., Triandria Digynia; growing in almost all parts of the world.

Description. The decorticated grains are known as groats; when decorticated and ground to powder, as prepared groats. First dried in a kiln, and then coarsely ground, they form Oatmeal.

Prop. & Comp. Oatmeal contains *starch, gluten,* lignin, sugar, and bitter extractive. The amount of starch is considerable, amounting sometimes to 72 per cent.

Therapeutics. A useful demulcent and emollient, much used in the form of a decoction familiarly known as gruel, also as an enema.

Ergota *Lond.* The seed of the Secale cereale, diseased by a parasitic fungus? Secale Cornutum, Spurred Rye.

Description. Ergot occurs in grains, varying in length from a few lines to an inch or more, and in breadth in the same proportion; somewhat triangular in form, curved, tapering towards each extremity, furrowed on two sides, of a purple or brown colour, covered more or less by a bloom; moderately brittle; in

large quantities, having a peculiar odour. Ergot has been considered as a fungus growing in the place of the ovary between the glumes, or as a diseased condition of the ovary produced by the presence of a parasitic fungus, named the Ergotætia abortifaciens. The latter view seems to be the one more generally in vogue at present.

The healthy grain of rye consists of the seed-coat, composed of outer and inner layers, and the cells, containing gluten; and next, the cells of albumen, containing starch. In the ergotised grain, the seed-coat and gluten cells are replaced by a layer of dark cells—the cells of the albumen by the cells of the ergot, and the starch grains of these cells by drops of oil. The bloom consists of the sporidia of the Ergotætia abortifaciens.

The ergot is liable to be fed on by a species of acarus, which sometimes destroys the whole interior, leaving only the outer shell.

Prop. & Comp. It contains a large quantity of fixed oil. This, when obtained by evaporating an etherial tincture of the ergot, possesses active properties; hence it was at first thought to be the active principle: subsequent researches have shown, however, that the fixed oil, when obtained by expression, is inactive, and it would seem that the active principle is extracted with the oil, and remains dissolved in it, but the oil itself is not that principle. A peculiar reddish-brown substance having active properties has been named *Ergotine;* this, it would appear, is complex, and capable of separation into an acid, the *ergotic*, and a volatile alkaloid named *Secaline.* By distilling the extract with potash, propylamin has been procured, a substance having the peculiar odour of herring pickle. Ergot yields its virtues to alcohol, water, and ether.

Off. Prep. Tinctura Ergotæ Ætheria, Lond. Etherial Tincture of Ergot. (Ergot, bruised, ℥xv; ether, Oij. Macerate for seven days, then press out, and strain.)

Therapeutics. Ergot exercises a peculiar influence on the muscular coat of the uterus, causing powerful contractions, especially when in a pregnant state; it also acts on the muscular coats of the vessels of that organ, and apparently on those of the general system. When taken for a long period in small quantities, as in the form of bread made from ergotised grain, it produces a species of gangrene, resembling gangrena senilis, probably due to its causing obstruction of the vessels by diminishing their calibre. In large doses it induces nausea, vomiting, delirium, stupor, and even death. Its action is said

to diminish the frequency and fulness of the pulse. It is most frequently employed to cause contraction of the uterus in cases of labour, and the contractions induced by it differ from the natural ones in being continued, instead of alternating with relaxations. In hæmorrhage after delivery it is especially indicated, also in menorrhagia, leucorrhœa, and sometimes in amenorrhœa.

Dose. Of the etherial tincture, f.ʒj to f.ʒjß; of the powdered ergot infused in water, ℈j to ʒj.

Saccharum *Lond.* The purified crystalline juice prepared from the stem of Saccharum officinarum; White Sugar; Lin. Syst., Triandria Digynia; cultivated in the East and West Indies.

Sacchari Fæx *Lond.* Molasses, or Treacle. The impure juice prepared therefrom.

Description. White or lump sugar, and molasses, or treacle, are too familiar as articles of domestic economy to receive description.

Prop. & Comp. *Molasses* is the uncrystallisable liquid forming the mother liquor from which the sugar is crystallised; the crystalline portion is clarified and refined in a manner the description of which would occupy too much space in a work of the present size. *Cane sugar* has the formula ($C_{10}H_{11}O_{11}$); it is soluble in half its weight of cold, and in a much less quantity of hot water; a very strong and viscid solution is called Syrup. Carefully crystallised from a strong solution with the addition of spirit, it forms oblique four-sided prisms, *sugar candy.* Heated to 365° Fah., it melts, forming a viscid liquid, which, when suddenly cooled, solidifies into an amorphous transparent substance, called *barley sugar.* It is less soluble in water than grape sugar, and readily converted into that substance by the action of weak acids, or by fermentation; the amount of solid matter in treacle is said to be about 75 per cent.; its specific gravity is 1·5.

Off. Prep. Syrupus, Lond. Syrup. (Sugar ℔iij; distilled water, Oj. Dissolve with a gentle heat.)

Therapeutics. Sugar is demulcent; its sweet taste renders it useful to cover the unpleasant flavour of some remedies. Sugar is used in the preparations of the syrups of the London Pharmacopœia, with the exception of syrupus sennæ, in which treacle is employed; this latter substance is also used to give consistence to pills.

Dose. Ad libitum.

Adulteration. Sugar is liable to contain some sulphate of lime, and also lead, from its mode of purification; but the proportion of these substances is so minute, that, though not harmless when sugar is daily used in considerable quantities for domestic purposes, they are innocuous in the amount given medicinally.

CLASS III. ACOTYLEDONES.

SUB-CLASS I. ACROGENÆ.

FILICES.

Filix *Edin.* Rhizome of Nephrodium Filix mas; Lin. Syst., Cryptogamia Filices; Male Shield Fern; grows in shady places in Europe, Africa, and America.

Description. The central part, or caudex, is thick and cylindrical, with numerous leaf-stalks surrounding the axis; the spaces intervening between are covered with silky scales, and numerous radicles descending beneath them. The dried root is of a brown colour externally, yellowish within, with a peculiar though slight odour, and a taste at first sweet, then bitter. The colour of the powder should be yellowish-green.

Prop. & Comp. In addition to starch, gum, and salts, male fern contains a *volatile oil, resin,* and a *fixed oil.* The active properties of the rhizome are soluble in ether; the etherial extract known as the *oil of male fern* is of a dark colour, containing the volatile and fixed oil, resin, and colouring matter in solution.

Therapeutics. It is used as an anthelmintic, and acts apparently by killing the worms, and thus aiding their expulsion from the intestinal canal. Its use has been attended with much success in cases of tapeworm; it is said to be more useful against the Bothriocephalus latus than the Tænia solium. It should be given on an empty stomach, and generally followed after an interval by some mild purgative.

Dose. Of the powder, ʒj to ʒiij; of the etherial oily extract, ♏x to ♏xxx.

SUB-CLASS II. THALLOGENÆ.

LICHENES.

Cetraria *Lond.* Cetraria Islandica. Lichen islandicus; Iceland Lichen or Moss; Liverwort; obtained in large quantities in Iceland, hence its name.

Description. Iceland moss consists of a foliaceous thallus, the lobes irregularly subdivided, leathery, smooth, of a light-brown or reddish colour, fringed at the edges.

Prop. & Comp. The soluble portion is taken up by boiling water. The decoction, on cooling, thickens, and deposits a gelatinous matter; this, when dried, forms a semi-transparent mass, insoluble in cold water, alcohol, or ether, but soluble in boiling water, and strikes blue with iodine; this is named *Lichenin.* Iceland moss contains also a *bitter principle,* soluble in alcohol and ether, and readily in alkaline solutions, but sparingly so in water; this is crystallisable, and has acid properties; it is called *cetraric acid.*

Off. Prep. DECOCTUM CETRARIÆ, LOND. Decoction of Iceland Moss, or Liverwort. (Iceland moss, ℥v; distilled water, Ojß. Boil down to a pint, and strain.)

Therapeutics. Iceland moss, deprived of its bitter principle, is used by the natives of Iceland and Lapland as an article of diet. The decoction is demulcent, and slightly tonic. The cetraric acid is said to have been useful in intermittents as a substitute for quina.

Dose. Of the decoction, f.℥j to f.℥ij.

Lacmus *Lond. Appendix.* Litmus, a peculiar colouring matter, obtained from Rocella tinctoria, Lecanora tartarea, and other lichenous plants. Litmus is extensively prepared in Holland.

Description. It occurs in small cakes, made up of a granular powder of a fine blue colour.

Comp. & Prop. It is prepared by macerating the lichen for some time in water, rendered alkaline by lime and potash, and mixed with urine; a species of fermentation occurs: the mass becomes first red and afterwards blue; it is then removed and reduced to the proper consistence by sand, lime, &c. The infusion, with a small quantity of spirit, known as the tincture of litmus,

has its blue colour changed to red on the addition of acids, while alkalies restore the blue colour to it if previously reddened by an acid. Litmus-paper is prepared by painting over unsized paper with the solution of a proper consistence, and then drying. Dipped into an acid liquid it is reddened, hence its use as test-paper to ascertain the reaction of liquids. Red litmus may be prepared by using the solution first reddened by an acid. From Rocella tinctoria and Lecanora, a peculiar acid, *lecanoric acid*, may be obtained. Heated with alkalies this is converted into *Orcine*, a substance occurring in long prismatic crystals. Under the influence of ammonia, this last is changed into *orceine*, which is probably the colouring matter of the lichen: by the action of potash and soda it becomes of a violet-blue colour. The same principle may also be obtained from the other lichens which are the source of litmus, though the acids differ somewhat in the different species.

Therapeutics. Rarely given internally; principally employed as a colouring matter, or as a test: for that purpose it is introduced into the Appendix of the London College.

ANIMAL KINGDOM.

CLASS, MAMMALIA.

RODENTIA.

Castoreum *Lond.* The follicles of the prepuce of the Castor Fiber Beaver, filled with a peculiar secretion; Castor.

Description. The castor of commerce is of two varieties, the Russian and Canadian; the former is the most highly prized. This substance is secreted by a pair of membranous pear-shaped follicles, situated between the anus and external genitals, and united by a common duct to one another. It is a dark-coloured matter, of the consistence of putty, with a peculiar odour, contained in the sacs in which it is secreted. In Russian castor, the sacs are larger, fuller, and have a stronger smell. In the Canadian variety, they are more or less wrinkled externally, and the contents inferior. The consistence of the contents varies with the amount of water present.

Prop. & Comp. Castor contains *volatile oil,* uric, phosphoric and benzoic acids, combined with potash, soda, and lime, also carbonate of ammonia, *salicine, carbolic acid,* and a peculiar principle, *castorin.* Its active properties are taken up by ether and alcohol; slightly by water; but they are decomposed by boiling for some time.

Off. Prep. TINCTURA CASTOREI, LOND. Tincture of Castor. (Castor, bruised, ℥iij; rectified spirit, Oij. Macerate for seven days, then press and strain.)

Therapeutics. Castor is stimulant, and antispasmodic; hence it has been used in hysteria and epilepsy, and also to rouse the system in cases of an adynamic type, as in typhoid pneumonia.

Dose. In substance, gr. v to xv; of tincture, f. ʒß to f. ʒij.

RUMINANTIA.

Moschus *Lond.* A concretion deposited in the follicle of the prepuce of Moschus moschiferus; Musk.

Description. Musk is contained in a sac situated midway between the umbilicus and the prepuce; the sac is oval and hairy, opening externally by a narrow orifice, small and hairy at its anterior part; internally, lined by a smooth membrane, secreting the musk. There are two chief varieties, the Chinese and the Russian. The sacs are hairy on one side, destitute of hair on the other, with the hairs concentrically arranged around the opening; the Chinese sacs are the smallest, and the colour of the hairs darker than in the Russian variety.

Prop. & Comp. Musk occurs in grains concreted together, soft to the touch; the odour is very strong, and diffuses itself over a great space; it contains ammonia, stearine, oleine, cholesterine, various salts, and small quantities of animal matter, with a *volatile oil,* thought by some to be in combination with ammonia; the proportion of these ingredients varies in different specimens; the active properties are soluble in alcohol and ether. Potash evolves ammonia, and increases the peculiar odour.

Therapeutics. Action stimulant and antispasmodic, resembling castor, and is useful in the same class of cases.

Dose. Gr. v, and upwards.

Adulteration. On account of the high price of this drug, it is very liable to be adulterated; the sac containing the musk is often emptied of its contents, and mixed up with a mixture of dried blood, with a greater or less proportion of the musk enclosed, the sac being carefully closed again; the opening should be sought for. Sacs are manufactured from the scrotum or skin of the animal, and filled with a spurious mixture of musk, sand, and dried blood. The form and character of the bag should be noted, to see whether it differs from that described as genuine; the bag, if made from any other portion of the skin, may be recognised by the peculiar arrangement and microscopic characters of the hairs.

Sevum *Lond.* The prepared fat of Ovis Aries; Suet.

Description. Suet is the fat of the sheep chiefly obtained from the region of the kidney. It is prepared by melting at a gentle heat, and straining. Mutton fat is very solid, and has a high melting-point; it is soluble in ether and boiling alcohol; it consists chiefly of *stearine, oleine,* and a little *hircine. Stearine* forms the chief portion of suet; it may be obtained crystallised from an etherial solution, and then appears in small white plates of a shining character; fuses at 143° Fah., and when it

solidifies, becomes opaque, and loses its crystalline character; soluble in alcohol and boiling ether, but insoluble in cold ether; its formula is (C_{142} H_{140} O_{16}), or is a compound acid like the sulpho-vinic, formed by the combination of 2 eq. of stearic acid (C_{68} H_{66} O_5) with 1 eq. of glycerine, and one of water; by saponification it is converted into stearic acid (C_{68} H_{66} O_5), and glycerine (C_6 H_7 O_6). *Oleine* is the more liquid constituent of fats: it forms an oily fluid varying in quantity in the different varieties of fat, and generally holds in solution more or less of the solid constituents, from which it is separated completely with some difficulty. It exists in large quantity in the vegetable oils. Its exact composition is doubtful; it is more soluble in alcohol than either stearine or margarine; by treatment with an alkali it is resolved into oleic acid (C_{36} H_{33} O_3 + HO) and glycerine. *Hircine* is a liquid resembling oleine, but more soluble in alcohol; by saponification it is converted into hircic acid and glycerine.

Therapeutics. Suet is emollient, and is used in the preparation of certain ointments and plasters, also sometimes as addition to poultices.

Cornu *Lond.* The horn of Cervus Elephas; Hartshorn.

Cornu ustum *Lond.* Burnt horn; Phosphate of Lime, prepared from horn by fire.

Description. Hartshorn is met with in the form of fine shavings, of a yellowish colour, without odour. Cornu ustum occurs as a white powder, obtained by the calcination of the horn.

Prop. & Comp. Hartshorn yields about 27 per cent. of *gelatin*, and 57·5 of *phosphate of lime*. By destructive distillation, the shavings yield an impure solution of carbonate of ammonia, formerly known as spirits of hartshorn. Phosphate of lime as prepared from the horn occurs in the form of a whitish powder; it consists of phosphate of lime (3 Ca O, PO_5), but often contains some lime not in the state of phosphate: this phosphate is identical with bone-earth.

Off. Prep. Hartshorn is used in the preparation of Pulvis Antimonii Compositus.

Therapeutics. The gelatine flavoured to the taste may be used as an article of diet. Cornu ustum has been recommended in rickets and mollitus ossium.

PACHYDERMATA.

Adeps *Lond.* The prepared fat of Sus scrofa; Hog's Lard.

Description. Lard is too familiar to need description: the London College directs that it should not be used if cured with salt.

Prop. & Comp. Consistence soft, fuses between 80° and 90°; it consists of a large quantity of oleine (60 per cent.), with some margarine and stearine: these substances, with the exception of margarine, have been before described. Margarine may be broken up into margaric acid and glycerine; it is more soluble in cold ether than stearine.

Off. Prep. Used in the preparation of several cerates and ointments.

Therapeutics. Lard is emollient, it is sometimes added to poultices to prevent their getting dry and hard.

CETACEA.

Cetaceum *Lond.* A concretion prepared from the oily matter of the head of Physeter macrocephalus; Spermaceti.

Description. A peculiar semi-concrete oily substance which is contained in numerous cells situated in the large cavity of the upper jaw of the sperm whale. The oily substance, on standing, separates into an oil, and a peculiar substance capable of crystallisation, spermaceti. The oil is poured off, and the spermaceti collected.

Spermaceti occurs in white crystalline cakes, slightly unctuous; it fuses at 112° Fah., and when quite free from oil has been named *Cetin.* It is combustible, soluble in the fixed oils, and in boiling ether or alcohol. By the action of an alkali it is broken up into an acid, the Ethalic, and a substance somewhat resembling glycerin, called Ethal. Ethalic acid is isomeric with palmitic ($C_{32}\,H_{32}\,O_4$). Recent analysis would make it appear that this is a complex substance, consisting of margaric, palmitic, cetic, myristic, and coccinic acids.

Off. Prep. CERATUM CETACEI, LOND. Spermaceti Cerate. (Spermaceti ℥ij; white wax ℥viij; olive oil Oj. Add the oil to the spermaceti and wax melted together, and stir them with a spatula till they cool.)

UNGUENTUM CETACEI, LOND. Spermaceti Ointment. (Spermaceti ℥v; white wax ʒxiv; olive oil Oj, or as much as may be necessary. Having melted all together, stir constantly till they become cold.)

Therapeutics. Emollient; formerly given internally, but now chiefly used externally as an emollient application.

CLASS, AVES.

Ovi Albumen *Lond.* The albumen of the egg of Gallus Bankiva (var. domesticus).

Ovi Vitellus *Lond.* The yolk of the egg.

Description. The *albumen,* or white of the egg, is a transparent, viscid, glairy liquid, miscible with water, coagulated by a heat of 160° Fah., and then becomes opaque, and of a milk-white colour, insoluble in water; by careful drying, at a moderate temperature, it may be solidified, retaining its transparency. It is coagulated by ether, in which respect it differs from the albumen of blood; coagulated also by corrosive sublimate.

The *yolk* of the egg is of a yellow colour, coagulated by heat; it yields a fixed oil by expression. It contains a peculiar albuminous principle, named *Vitellin,* oleine, margarine, cholesterine, together with salts of lime, iron, &c., &c.

Off. Prep. The yolk of egg is made use of in the preparation of enema terebinthinæ, and mistura spiritûs vini Gallici.

Therapeutics. The albumen is recommended as an antidote in cases of poisoning by corrosive sublimate and sulphate of copper. The yolk is a mild, nutritious article of diet, and, used in the form of mistura spiritûs vini Gallici, it forms a useful and nutritious mixture, much employed in exhausted conditions of the system, where solid food cannot be taken. It is much used in the formation of emulsions. An astringent application is made by dissolving alum in albumen; the latter is coagulated, and in this form is applied locally.

CLASS, PISCES.

Ichthyocolla *Lond. Appendix.* Isinglass.

Description. Isinglass is the dried swimming bladder of the sturgeon, but many fish yield a similar substance.

Prop. & Comp. Isinglass consists of a gelatinous tissue, which, by boiling, yields gelatine, a substance which is soluble in hot water, but forms a jelly when cool; it is precipitated by tannin, but not by gallic acid. The combination of gelatine with tannin forms the basis of leather, called often *tanno-gelatin.*

Use. Isinglass is introduced into the Pharmacopœia for separating tannin from gallic acid: when given internally, it is demulcent and nutrient, and useful during convalescence.

Morrhuæ Oleum *Lond.* The Oil prepared from the liver of Gadus morrhua. Cod-Liver Oil.

Description. The liver of the common cod-fish and other species of Gadus frequenting the seas of Northern Europe and America, as G. callarias, G. carbonarius, yields the oil of commerce. The oil may be extracted from the liver by two different methods: either by boiling them in water for some time, and separating the oil which floats on the surface of the water; or by dividing the livers, and permitting the oil slowly to drain from them. Three chief varieties occur in commerce, distinguished by their colour: the pale, the light brown, and the dark brown; this difference in colour being dependent on the different modes of its preparation, the freshness of the liver, &c. The odour and taste of cod-liver oil is peculiar and fishy, but varies much in different specimens.

Prop. & Comp. The composition of the three varieties is essentially the same, but the darker contains more empyreumatic matter, and is less agreeable to the taste; its sp. gr. is about 0·924. Cod-liver oil contains *oleine, margarine,* various *biliary principles,* as the organic acids and colouring matter of bile; also phosphoric and sulphuric acid, with salts of lime, magnesia, and iron; a peculiar substance, *gaduin* ($C_{35}\ O_{23}\ H_9$), very insoluble in ordinary menstrua, but soluble in sulphuric acid, and giving a blood-red colour to the solution; also *iodine* and *bromine.* The oleine and margarine of this oil are said by some to differ from that usually met with, inasmuch as no glycerine can be obtained by saponification, but they yield

instead a peculiar body, called propyline, or *oxide of propyl.* The proportion of iodine is not more than 0·05 per cent. When pure cod-liver oil, spread in a thin layer on a plate, has a drop of oil of vitriol added to it, a beautiful lake or crimson colour is produced, rising from the point of contact of the oil and acid, and rapidly spreading over the surface. This is probably due to the action of the acid on the biliary principles present in the oil.

Therapeutics. Cod-liver oil is a remedy which, at the present time, stands very high in estimation, nor does it appear probable that its repute will be ephemeral in character; how it acts is yet undetermined. When taken for a time by patients who have become emaciated from any cause, and whose blood is impoverished, it frequently restores the flesh; and, from Dr. Theophilus Thomson's statements, it appears also to improve the richness of the blood. Under its influence, patients often gain an almost incredible increase of weight, exceeding many times the amount of the oil which has been taken during the period. The oil also seems to possess the power of arresting the progress of certain morbid actions, such as occurs in phthisis and scrofula, and the low form of rheumatic and other inflammations; in fact, many anomalous diseased conditions become ameliorated under its influence. It has been supposed that the iodine and bromine contained in it might produce the beneficial results, but the idea is not tenable, for the effects of the remedies are very different in character; it would seem probable that it acts simply as an *oil,* and that it is superior to other oils on account of its being more readily assimilated. If the statement of Winkler proves correct, namely, that the oleine differs from ordinary oleine in not yielding *glycerine,* this may in part explain its value. It very seldom happens that patients cannot take the remedy, even when ordinary fatty substances disagree with their stomachs; it very rarely purges, except in cases when ulceration of the intestines is present. Cod-liver oil is employed extensively in the treatment of the different stages of phthisis, and various forms of scrofula; in chronic rheumatism and neuralgia; in chronic skin affections, and many other diseases of a low type and accompanied by a cachectic condition of the habit. It has been applied externally in some skin affections, and occasionally, with the idea of producing by this means its constitutional effects.

Dose. From f.ʒj to f.℥ß; taken on the top of water, milk, orange wine, ale, or porter. Some patients prefer it at the time of a meal, or immediately after food.

Adulteration. Many oils may be mixed with cod-liver oil. The addition of the liver oil from other fish is not, perhaps, very important in a therapeutic point of view, and would be difficult or impossible to detect, as all give the test with sulphuric acid. When other oils, not of hepatic origin, are present, the sulphuric acid test is valuable, for the impure specimen either does not give the beautiful lake colour, or this becomes immediately mixed and obscured by a dark brown substance, from the charring of the oil: such is the case with whale or seal oil; also with olive and other vegetable oils.

CLASS, INSECTA.

HYMENOPTERA.

Mel *Lond.* The secretion of flowers deposited in the honeycomb by the apis mellifica, and purified.

Description. It is a viscid fluid of a slight yellow colour; the purest is obtained by allowing the honey to flow from the comb.

Prop. & Comp. It consists chiefly of grape sugar, formula (C_{12} H_{14} O_{11}). Its sp. gr. 1·34: it has an aromatic odour dependent in part on the flowers from which it is obtained. It is often adulterated with starch, and this adulteration is ascertained by making a solution in hot water, and adding iodide of potassium with nitric acid; no blue colour should be given.

Off. Prep. Oxymel, Lond. Oxymel. (Acetic acid, f.℥vij; distilled water, f.℥viij; honey ℔v. Mix the acid added to the water with the honey made hot.)

Honey is also used to make Mel Boracis, Mel Rosæ, and Oxymel Scillæ, which have been already described; and it is an ingredient in Confectio Piperis, Confectio Rutæ, Linimentum Æruginis.

Therapeutics. The action is much the same as sugar, but more laxative; it is generally used as a vehicle for other medicines.

Cera *Lond.* The prepared comb of apis mellifica. Wax.

Cera alba *Lond.* The same, bleached. White Wax.

Description. When the honey has been separated from the comb, the remaining portion melted constitutes cera or yellow wax. This when bleached forms cera alba. The yellow occurs in large irregular masses, but the white, in thin circular cakes, white, and odourless.

Prop. & Comp. Wax is separable by means of alcohol into three portions: *myricine,* almost insoluble in boiling alcohol; *cerine,* called also *cerotic acid,* soluble in boiling alcohol, but deposited when the liquid becomes cold; and *ceroleine,* which remains in solution in cold alcohol. These substances exist in different proportions in different specimens of wax. Myricine, by the action of potash, may be converted into palmitic acid, and a neutral substance, melissine; this substance, by oxidation, yields an acid, the melissic, which bears the same relation to melissine that acetic acid does to alcohol. In some varieties of wax a substance, cerotine, exists, which stands in the same position to cerotic acid as melissine to melissic acid.

Off. Prep. It enters into the composition of all the cerates of the Pharmacopœia, and is used also in Emplastrum Cantharidis, Cumini, Picis, and Potassii Iodidi, and many of the unguents.

Therapeutics. Demulcent, chiefly used in the preparations above mentioned, to give consistence to them.

HEMIPTERA.

Coccus *Lond.* Coccus Cacti. Cochineal. The Cochineal Insect.

Description. Of an oval form, convex on one side, flat and slightly concave on the other, about ⅛th of an inch in diameter, wrinkled. One variety is of a reddish-gray colour, formed by the sprinkling of the red surface with a whitish powder; the other, nearly black with but little powder. Found wild in Mexico, where it is also cultivated as an article of commerce. The female insects are alone preserved; they are procured by brushing them off into bags, and killing them by immersion in hot water. The difference in the two varieties, the silver and the black grains, consists in this; the silver is made up of the impregnated female just before she has hatched her eggs; the black, of the insect after the eggs have been laid and hatched.

Prop. & Comp. Cochineal consists of fatty matters, salts, &c.,

and a peculiar colouring matter called *carmine*: it occurs in the form of small grains of a purple-red colour, soluble in water or alcohol. Acids increase the red colour, while alkalies render it violet.

Off. Prep. Syrupus Cocci, Lond. Syrup of Cochineal. (Cochineal, bruised, ℈iv; boiling distilled water Oj; sugar ℔iij, or as much as may be necessary; rectified spirit, f.℥ijß, or as much as may be necessary. Boil the cochineal for fifteen minutes in the water in a closed vessel, frequently stirring it; then strain, and complete the process as directed for Syrup of Marshmallow.)

Therapeutics. Chiefly used as a colouring matter, much employed in the arts as a dye; formerly used in pertussis.

Adulteration. Inferior cochineal is sometimes covered with some white powder, as talc or sulphate of baryta, to give it the appearance of the finer variety.

COLEOPTERA.

Cantharis *Lond.* Cantharis vesicatoria, Lytta vesicatoria; the Blister Beetle, or Spanish Fly; common in the South of France, Italy, and Spain.

Description. The insect is from a half to three-fourths of an inch long; the elytra or wing-sheaths are long, of a fine metallic green colour, and encase two thin brownish membranous wings. They swarm upon the trees about May or June, especially on the ash, lilac, and privet; they are brushed off by persons carefully masked, and received into linen cloths; they are killed by plunging into boiling vinegar, and then dried.

Prop. & Comp. The flies have a peculiar urinous disagreeable odour, and a burning taste; in addition to a volatile principle and fatty matters, they contain a crystallisable principle, *Cantharidine*, upon which the active properties depend. In the crystalline form, this is insoluble in water, nearly so in cold alcohol, but more soluble in ether, chloroform, and strong acetic acid; the active properties of the insect are partially yielded to water and cold alcohol, hence it would appear to exist in the fly, as some more soluble compound. From one thousand parts of the flies, about four parts of pure cantharidine have been procured; cantharidine has the formula (C_{10} H_6 O_4); it may be sublimed without injury; it has very powerful vesicating properties.

Off. Prep. ACETUM CANTHARIDIS, LOND. Vinegar of Cantharides. (Spanish flies reduced to the finest powder, ℥ij; acetic acid, Oj. Macerate for eight days with the acid, frequently shaking them; then press and strain.)

CERATUM CANTHARIDIS, LOND. Cerate of Cantharides. (Cantharides rubbed into fine powder, ℥j; spermaceti cerate ℥vj. Add the cantharides to the cerate softened by heat.)

EMPLASTRUM CANTHARIDIS, LOND. Plaster of Cantharides. (Cantharides rubbed to very fine powder, ℔j; wax, suet, each ℥vijß; resin ℥iij; lard ℥vj. To the wax, suet, and lard, melted together, add the resin, previously melted; then remove them from the fire, and a little before they concrete, sprinkle in the cantharides, and mix.)

TINCTURA CANTHARIDIS, LOND. Tincture of Cantharides. (Cantharides, bruised, ʒiv; proof spirit, Oij. Macerate for seven days, then press and strain.)

UUGUENTUM CANTHARIDIS, LOND. Ointment of Cantharides. (Cantharides reduced into very fine powder, ℥iij; distilled water, f. ℥xij; cerate of resin, ℔j. Boil the water with the cantharides down to one-half, and strain; mix the cerate with the strained liquor, and afterwards let it evaporate to a proper consistence.)

Therapeutics. Cantharides, when applied externally, produce at first rubefacient and irritant effects, followed, if the preparation is strong, or long continued, by vesication; not unfrequently the active principle becomes absorbed, and the symptoms resulting from its internal administration then ensue. When taken internally in medicinal doses, the first indication is generally some diuresis, with a slight sensation referred to the neck of the bladder; and if the urine be then examined, it usually gives an indication of a trace of albumen; sometimes also a few blood disks are discovered by the microscope: when continued beyond this, strangury and bloody urine are produced, with priapism, sometimes aphrodisiac effects, and diminution or suppression of urine, and its sequences, convulsions and death: the spinal cord is supposed to be influenced by cantharides.

Externally the Spanish fly is often used as a rubefacient in the form of a liniment, made with the tincture or acetum cantharidis, in cases where rubefacients in general are indicated; it has the advantage of acting slowly and for a longer period, and being less irritating to the patient, than strong ammoniacal or acetic acid embrocations: as a vesicant, its employment is very general, more so than any other agent, forming the basis of the common blister, or emplastrum

cantharidis, also of acetum cantharidis, and of other non-officinal blistering applications: the ointment and cerate are used to keep open blistered surfaces. These applications are useful over inflamed deep-seated parts, as in pleuritis, pericarditis, pneumonia, and other internal inflammations, after the more active febrile symptoms have been subdued by depletion and antiphlogistic remedies; and to diseased and painful joints. Vesication is also made use of on account of its revulsive action in internal congestions, as of the head, &c.; and over painful parts unattended with inflammatory action, as in various neuralgic affections, and lastly, in diseased conditions of the skin itself.

Internally the tincture of cantharides is given in chronic affections of the nervous system, especially of the spinal cord, as in chronic forms of paraplegia, in incontinence of the urine, from want of tone in the bladder; occasionally it has been found useful in some non-inflammatory forms of albuminuria, and in hydrocephalus; also in skin affections, especially in those of a squamous character: probably its diuretic effect may be the cause of its value in the latter class of diseases. Sometimes it has been given in gleet and other mucous discharges.

Precautions to be used in the application and administration of Cantharides.

When the kidneys are acutely affected, the use of the Spanish fly, externally or internally, should be avoided, as the cantharidine is apt to become absorbed, and in young or very debilitated subjects vesication by this agent should be cautiously produced, as sloughing may ensue and prove troublesome and even dangerous: placing a piece of tissue-paper over the surface and removing the blistering application before vesication has been fully induced, and the subsequent application of a poultice will often prevent the occurrence of strangury, and, at the same time, too great injury to the skin; vesication will generally ensue after the poultice has been applied. Many substitutes for the ordinary blistering plaster have been proposed, such as the tela vesicatoria and blistering papers made by mixing an etherial or oily solution of cantharides with wax and fatty matters, and spreading the compound thinly on cloth or tissue-paper; also blistering liquids prepared by dissolving *cantharidine* in *glacial acetic* acid or *chloroform:* the former, which the author has extensively employed, will frequently vesicate rapidly when the ordinary blister has failed; it should however be used cautiously.

These liquid applications are more efficient than the *Acetum Cantharidis.*

Dose. Of tinctura cantharidis, ♏v to ♏xxx.

Adulteration. A beetle called the golden beetle has been found mixed with cantharides, and occasionally artificial glass tubes or beads coloured to imitate the Spanish fly have been added to increase the weight. It has been also asserted that flies deprived of their virtues by ether have been sold as genuine, and that euphorbium resin has been employed as an adulteration to powdered cantharides.

Several other coleopterous insects, as mylabris chicorii, &c., possess vesicating powers, and have been used in other countries as blistering agents.

CLASS, ANNELIDA.

Hirudo *Lond.* Sanguisuga medicinalis and S. officinalis. The Leech.

Description. Leeches have an elongated body made up of from 70 to 90 soft rings, with a muscular disc at both extremities, the hinder one the longest; the mouth, which is in the anterior disc, is tri-radiate, and contains three jaws, each of which is furnished with two rows of teeth; the intestinal canal is straight.

The two species in most common use are the Sanguisuga officinalis, from the South of Europe, called also the Hungary leech, and S. medicinalis, the green and the gray leech, native of most parts of Europe, often named the English or speckled leech. The former is distinguished by the olive-green colour of the belly, which is unspotted; in the latter it is of a yellowish-green colour, spotted with black. Both are marked with six rusty coloured longitudinal stripes; in the latter variety these also are spotted with black.

Therapeutics. Leeches are employed for the local abstraction of blood from those parts where cupping is not thought advisable. The quantity of blood drawn by a leech is about ʒjß, though by fomentation of the part perhaps ℥ß may be obtained.

Bleeding from leech-bites may be stopped by pressure, by matico, by the application of collodion or of caustic; sometimes they require a suture.

CLASS, PORIFERA.

Spongia Officinalis *Edin.* The Officinal Sponge. Sponges inhabit the bottom of the sea, where they are fixed to rocks. The best varieties are obtained from the Mediterranean and Red Seas, inferior qualities from the West Indies.

Description. Sponge is prepared for use by standing for some days in cold water, the concretions which it contains being separated by occasional beatings. It is afterwards steeped in water acidulated with hydrochloric acid, by which the remainder of the earthy particles are removed; in addition it is often bleached with sulphurous acid. The general appearance of the sponge is too well known to need description here.

Prop. & Comp. It consists of gelatinous matter, and various salts of lime, potash, magnesia, &c. Sponge, burnt and reduced to powder, was formerly used as a medicine, and is still officinal in the Edinburgh Pharmacopœia. It consists of a large amount of carbon, with carbonate and sulphate of lime, chloride of sodium and iron; also from 1 to 2 per cent. of iodide of potassium, with some bromide. It is upon the presence of these latter constituents that its medicinal properties depend.

Therapeutics. *Spongia usta*, or burnt sponge, has been much recommended in goître and strumous glandular swellings, in which cases it is still sometimes given. In addition to its use for domestic purposes, sponge is sometimes used in the form of a tent.

TABLE OF DOSES, BY GAUBIUS,

SERVING FOR A GENERAL GUIDE FOR THE ADMINISTRATION OF MEDICINES TO PATIENTS OF DIFFERENT AGES.

AGES.	PROPORTIONAL QUANTITIES.	DOSES.
For an adult	*suppose the dose to be* *One*	or 1 *drachm.*
Under 1 year	will require only . . . $\frac{1}{12}$	5 grains.
„ 2 years	„ „ . . . $\frac{1}{8}$	$7\frac{1}{2}$ grains.
„ 3 „	„ „ . . . $\frac{1}{6}$	10 grains.
„ 4 „	„ „ . . . $\frac{1}{4}$	15 grains.
„ 7 „	„ „ . . . $\frac{1}{3}$	1 scruple.
„ 14 „	„ „ . . . $\frac{1}{2}$	$\frac{1}{2}$ drachm.
„ 20 „	„ „ . . . $\frac{2}{3}$	2 scruples.
Above 21 „	the full dose . . . . . . —	1 drachm.
„ 65 „	the inverse gradation of the above.	

It should be borne in mind, that certain drugs, especially *opium*, must be administered with great care to children, and that *mercurials* can be taken for a long time by such subjects without the ordinary symptoms of mercurialisation being produced. Besides age, other circumstances, such as sex, temperament, climate and custom, have great influence on the action of medicines.

TABLE,

SHOWING THE PROPORTIONS IN WHICH SOME OF THE MOST IMPORTANT DRUGS OF THE PHARMACOPŒIA ARE CONTAINED IN THE OFFICINAL PREPARATIONS.

ANTIMONY.

f.℥j of Vinum Antimonii Potassio-Tartratis contains gr. ij of the salt, or f.ʒj contains gr. $\frac{1}{4}$.

ARSENIC.

f.℥j of Liquor Potassæ Arsenitis contains gr. iv of Arsenious Acid, or ♏v contain gr. $\frac{1}{24}$.

f.℥j of Liquor Arsenici Chloridi contains gr. jß of Arsenious Acid, or ♏xiijß contain about gr. $\frac{1}{24}$.

MERCURY.

(METALLIC.)

Gr. viij of Hydrargyrum cum Cretâ contain gr. iij of Metallic Mercury.

Gr. iij of Pilula Hydrargyri contain gr. j of Mercury.

Gr. ij of Unguentum Hydrargyri contain gr. j of Mercury.

(CALOMEL.)

Gr. vj of Pilula Hydrargyri Chloridi Composita contain gr. j of Calomel.

(CORROSIVE SUBLIMATE.)

f.ʒj of Liquor Hydrargyri Bichloridi contains gr. $\frac{1}{16}$ of Corrosive Sublimate.

ARSENIC AND MERCURY.

f.ʒj of Arsenici et Hydrargyri Hydriodatis Liquor (*Dub.*) contains about gr. $\frac{1}{12}$ of Arsenic and gr. $\frac{1}{4}$ of Mercury, estimated as metals.

OPIUM.

Gr. x of Pulvis Ipecacuanhæ Comp. contain gr. j of Opium.

Gr. xx of Pulvis Kino Comp. contain gr. j of Opium.

Gr. xl of Pulvis Cretæ Comp. cum Opio contain gr. j of Opium.
Gr. v of Pilula Saponis Comp. contain gr. j of Opium.
Gr. v of Pilula Styracis Comp. contain gr. j of Opium.
♏xiijß of Tinctura Opii contain gr. j of Opium.
♏xiijß of Vinum Opii contain about gr. j of Opium.
f. ℥ß of Tinctura Camphoræ Comp. contain nearly gr. j of Opium.
Gr. xxx of Confectio Opii contain about gr. j of Opium.
f. ℥ij of Enema Opii contain about gr. j of Opium.

MORPHIA.

f.ʒj of Liquor Morphiæ Hydrochloratis contains gr. j of the salt.
f.ʒj of Liquor Morphiæ Acetatis contains gr. j of the salt.

PREPARATIONS OMITTED.

Manganesii Binoxidum *Lond.* Binoxide of Manganese.

Prop. & Comp. Binoxide of Manganese, called also Black Oxide of Manganese, is found native, sometimes crystallised, sometimes amorphous; as met with in commerce it is a black heavy powder, devoid of odour and taste; yielding, when heated with hydrochloric acid, or with sulphuric acid and salt, chlorine gas. It consists of the metal Manganese, which has some resemblance to iron, and oxygen. Formula ($Mn\ O_2$).

Use. In the preparation of Liquor Sodæ Chlorinatæ, and Liquor Chlorinii. It may be employed also as a source of oxygen by heating it alone, or with sulphuric acid.

Therapeutics. Manganese preparations have been occasionally employed in medicine: the sulphate of the protoxide, in large doses, as from ʒj to ʒij, produces purgative effects, and by some is considered to increase the excretion of bile: in small doses this salt, as well as the carbonate, have been given, with the idea of improving the condition of the blood, in cases of anæmia; but its value has not as yet been satisfactorily established. The binoxide is not used in medicine.

PILULA CONII COMPOSITA, LOND. Compound Conium Pill. (Extract of Conium ʒv; ipecacuanha, powdered, ʒj; treacle, a sufficiency. Rub together to form a pill mass.)

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